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T- BULLETIN No. 101. -150

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Report of Work at McNeil Branch Experiment Station for 1906.

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By E. B. FERRIS.

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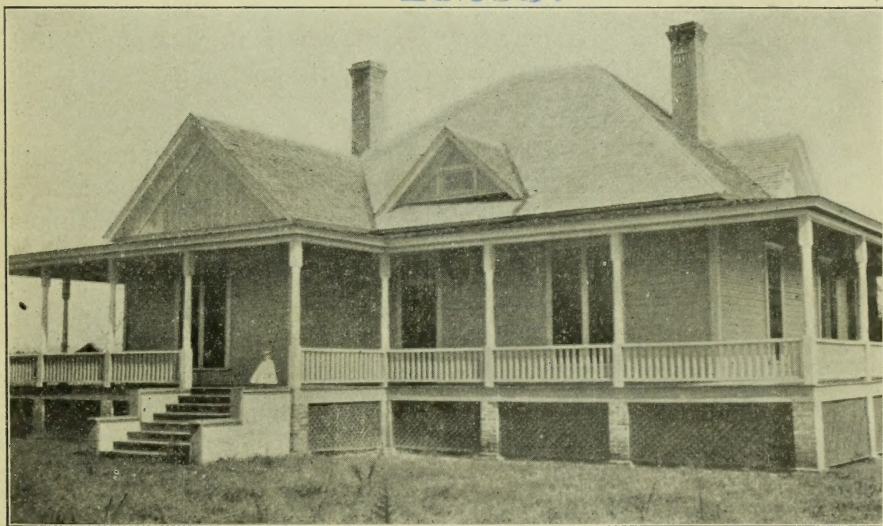


FIGURE 1.—RESIDENCE McNEIL EXPERIMENT STATION.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

JANUARY, 1907.

~~132837~~
Tucker Printing House, Jackson, Miss.

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REPORT OF WORK AT McNEILL BRANCH EXPERIMENT STATION FOR 1906.

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No. 101-150

BY E. B. FERRIS.

Introduction.—Work at the McNeill Station during 1906 has been conducted along the same lines as heretofore reported in our four annual reports. On the whole it has been more satisfactory than ever before; first, because the lands have been in cultivation longer and are in better shape every way for producing crops; and, second, because the seasons have been less extreme than heretofore. Good yields were made with nearly every class of crop grown here during 1906, and the year's work shows conclusively that the "Pine Belt" offers just as good natural advantages for successful agriculture as any section of Mississippi. The only trouble, just now, is the lack of sufficient labor to do any thing more than develop the timber industry which overshadows every thing else.

Season.—The seasons were less extreme than heretofore, there being no excessively heavy rains during January, February, and March, nor any severe droughts in April, May, and June. The minimum temperatures and total rainfall for each month were as follows: January, 25 degrees, and 3.46 inches; February, 29 degrees, and 4.51 inches; March, 28 degrees, 6.57 inches (one day's rainfall not obtained); April, 38 degrees, 1.96 inches; May, 45 degrees, 3.02 inches; June, 64 degrees, 5.47 inches; July, 68 degrees, 5.80 inches; August, 68 degrees, 3.83 inches; September, 65 degrees, 10.23 inches; October, 38 degrees, .78 inches; November, 27 degrees, 1.09 inches; December, 26 degrees, 2.48 inches.

As a rule the seasons here may be divided yearly into four distinct periods, the first three months usually being excessively wet, the next three entirely too dry, the following three months again too wet, and the last three rather dry. Being so, we find that by exercising care as to the time of planting crops, much can be gained in the way of better seasons and larger yields. Vegetables should be started extremely early, especially those like beets, onions, cabbage, etc., that can stand considerable cold; while such crops as corn, cowpeas, and peanuts have invariably done better when planted late, so as to have the corn still young during the dry months of May and June when moisture is so necessary to old corn, and also to have the peas and

peanuts ripen in the dry months of the fall. The Station has grown winter grains and legumes, beets, cabbage, lettuce, onions, rutabagas, and turnips here through several winters without having them injured by frost. By starting all such crops as early as possible they mature before the dry weather of the late spring hurts them seriously.

Removing Stumps.—Before the first of March, the Station will have removed, since the first of November, the stumps from about forty acres of land in the two back fields. These two fields have been cultivated up to this time with the stumps on the land and the crops have demonstrated that it is an expensive thing to do. It is impossible to use labor-saving implements on stump land; a large per cent. of the field is taken up by the stumps and the vacant space required to plow around them; much hoeing is required to keep down grass near the stumps that cultivators cannot remove; and it is difficult to control the excess of rainfall on such land so as to keep it from washing away the soil.

After trying many ways to get rid of these stumps, we have not yet found an easier nor more economical way than by blasting them with dynamite and afterwards burning them. If a machine could be perfected by which holes might be bored, otherwise than by human power, entirely through the stump from the surface of the ground on one side to well beneath the surface on the other, these holes would act as flues and greatly facilitate and hasten the burning of the stumps. A flexible shaft machine has been suggested through the agricultural press of the State as offering a solution to the boring proposition, and the Station took the matter up with the manufacturers of such machines, who reported that a flexible shaft strong enough to bore an inch and a half hole through a stump would have to be so heavy as to be unwieldy. We are still at work on a better and cheaper means of removing these stumps.

In blasting stumps we have found that by properly boring the hole for receiving the charge of dynamite, these stumps may be shattered enough to burn well with an average of $\frac{3}{8}$ of a pound of dynamite per stump. This dynamite costs $13\frac{1}{2}$ cents. per pound, the caps cost 80 cents per hundred, and the fuse 60 cents per hundred feet. This makes the blasting material average $6\frac{1}{2}$ to 7 cents a stump, the holes can be bored for $\frac{1}{4}$ of a cent each, and from $2\frac{1}{2}$ to 3 cents ought to cover the cost of digging around the stump and burning the same, provided they are well dried and there is enough fuel on the ground to

assist in burning them. The average acre of cut-over land here will have one hundred stumps on it, and the average laborer will likely run the cost of removing them above the figures just given.

General Statement.—Heretofore, the Station has conducted a large number of tests with fertilizers under a great many crops, as many as thirty-six tests being made with a single crop, varying the proportions of the several ingredients of the fertilizers in many different ways. Experience has shown that it is not possible here, in the yield of the crop, to detect very slight changes in the composition of the fertilizer used under it, so, while not reducing the actual acreage devoted to fertilizer work, we have cut down the number of tests fully fifty per cent. and are duplicating and triplicating most of these tests. All work with fertilizers under corn and cotton this year has been done in triplicate, while that with cowpeas, peaches, sugar cane, and sweet potatoes has been done in duplicate. The work of growing fruits and vegetables for market and of getting all the information possible about the profits to be expected from such work has been continued with fair results.

FRUITS AND VEGETABLES.

Strawberries.—The same plots used last year for fertilizer work with strawberries were used again in 1906, this being the fourth crop of berries from the original setting of plants. These plots were fertilized just as they had been the year before, a mixture of 200 pounds of cotton seed meal, 200 pounds of acid phosphate, and 100 pounds of kainit being used as a unit application, one-half being applied at the first cultivation after the picking season was over, and the other half at the last cultivation in the fall. Records were kept of the berries gathered between April 7th and May 10th, inclusive. When the three fertilizing materials were used in the proportions given above, berries were gathered at the rate of 2,440 quarts per acre; when the cottonseed meal and kainit were cut down one half and the acid phosphate remained the same, the yield was 1,950 quarts per acre; when the cottonseed meal and kainit were normal and the acid phosphate was doubled, the yield was 2,490 quarts per acre; when the cottonseed meal and acid phosphate were normal and the kainit left out entirely, the yield was 2,520 quarts; when the cottonseed meal and kainit were normal and the acid phosphate was left out entirely, the yield was 2,375 quarts; the blank plot yielded at the rate of 2,205 quarts per acre; double the unit application gave a yield of 2,415 quarts per

acre. A second lot of berries were set out in the fall of 1905 and seven plots of these are now being used for fertilizer work, but the yields in the spring of 1906 were so small and irregular that the results, while actually obtained, seemed to show no effects due to the different ways of fertilizing the plants. These last named plots ought to give good results during 1907.

Marketing Berries.—As stated above, the strawberries set out in the fall of 1905 yielded very little fruit in the spring following. Fifteen 24-quarts cases would probably cover all the fruit gathered from a little more than one acre of these young plants. With the exception of these fifteen crates all other berries were gathered from the original patch of two acres, set out in the fall of 1902. The records show that we sold from the entire acreage 199.5 24-quart cases, 190 of which brought shippers net returns of \$426.25, the remaining 9½ cases having been consigned to parties who failed to remit for same. These berries were sold largely in Hattiesburg, Laurel, and towns along the N. O. and N. E. railroad, though a few shipments to Cincinnati, Chattanooga, and Birmingham gave remunerative returns. In addition to the 185 crates of berries sold from these two acres, there were sold during the fall and winter something more than 12,000 plants at an average price of \$2.25 per thousand, while some 15,000 plants were used to set additional land here. This makes the third profitable crop of berries obtained in succession from these two acres and the prospects are good for another average crop during 1907.

Peaches.—The work with fertilizers under peaches has been continued on the original ground, but in order to do away with discrepancies apparently due to variations in the soil, the number of combinations of plant food elements have been reduced fifty per cent, so that now there are being conducted only ten tests, each of which is being duplicated. The results from these tests during the past spring were very unsatisfactory, most of the fruit having been killed by a late freeze in the spring and the fruit left was very irregular and extremely faulty. Practically none of this fruit was worth shipping, so it was canned and utilized in this way.

As reported last year, San José scale was detected on certain peach trees during the latter part of last winter, at which time every fruit tree in this orchard was sprayed with the lime-salt-sulphur wash. This was done rather late in the winter, but before the foliage had put out to any extent the few trees actually affected were gone over and a second ap-

plication of the wash put on with a paint brush. At that time all the scale had apparently been killed, but before the year was over it had revived and spread to numbers of other trees in the orchard, some of which died, while many others had entire limbs killed on them. Not thinking it advisable to try and save these trees we dug up and burned all the trees in the variety orchard and also the trees in a commercial orchard covering one acre of ground and planted to Greensboro peaches, while all other trees were thoroughly sprayed with the above mentioned wash. Up until this time peaches have not done so well here as we had hoped they would. During 1906 a number of trees in the old orchard died from other causes than the scale insect. Borers from the start have given a great deal of trouble, and insects of many kinds, attacking both the trees and the fruit, have been prevalent. Some time in February 1906, 1,000 Elberta peach trees and 500 Red June plum trees were set out in a back field some five hundred yards from the orchard affected with scale. A careful examination has not disclosed, as yet, any scale on these trees.

Asparagus.—(*fertilizer tests*).—The same plots used last year for tests with fertilizers under asparagus were used again this year. On six plots of land of 1-16 acres each the same fertilizers were used that had been applied the year before, except nitrate of soda was used in the place of cottonseed meal. A mixture of 250 pounds of cottonseed meal, 125 pounds of nitrate of soda, 405 pounds of acid phosphate, and 170 pounds of kainit was taken as a unit application per acre and gave a calculated yield of 1,396 pounds of merchantable asparagus; when the supply of nitrogen and potash remained the same and the phosphoric acid was reduced one half, the yield was 1,128 pounds; with phosphorus normal and the amount of nitrogen and potassium reduced one half, the yield was 1,132 pounds; when the nitrogen and phosphoric acid were normal and the kainit was left off entirely, the yield was 1,076 pounds; the blank plot gave 952 pounds; a double quantity of the unit application gave 1,312 pounds. It is thought that one row of the first plot given was affected by manure applied to rose bushes, possibly within reach of the asparagus roots on this plot.

Cutting was commenced on these plots and on an older patch of $\frac{1}{2}$ acre, on March 13th and was discontinued on May 2d. The $\frac{1}{2}$ acre first planted here has failed to do well for the past two years and decidedly our best shipments were made from the seven test plots covering a little less than $\frac{1}{2}$ acre. From the entire acreage devoted to

this crop $49\frac{1}{2}$ boxes, or 990 bunches, were sold, bringing shippers net returns of \$93.35. The most of this asparagus was sold in Chicago, this city being decidedly our best market for it. About two additional acres of land have been set to asparagus during the present winter.



CABBAGE AT MCNEILL STATION.

Cabbage (*fertilizer tests*).—The Station conducted tests with fertilizers under cabbage on both parked and unparked land, but the yields were not at all satisfactory, due to the fact that a great many of the plants died and the ones that lived were affected with the cabbage root maggot, so that they were never in a healthy growing state. No blank plot was carried, since results for three years past have shown that cabbage will not head on the average soil here without some fertilizer. A mixture of 225 pounds of cottonseed meal, 121 pounds of nitrate of soda, 410 pounds of acid phosphate, and 170 pounds of kainit was taken as a unit application per acre and gave on the unparked land a calculated yield of 4,864 pounds and on the parked land 4,208 pounds of cabbage per acre; the same mixture, except for leaving out the kainit, gave 5,792 pounds on the unparked land and 5,696 pounds on the parked land. All the other tests were conducted on the unparked land where a double application of the unit gave 6,824 pounds; when the nitrogen and potash were normal and the acid phosphate was doubled the yield was 5,968 pounds per acre; when the nitrogen was increased fifty per cent. and the phosphoric acid and potash remained normal the yield was 4,656 pounds per acre. The reason attributed for the parked land having made smaller yields than the unparked land is that the cabbage plants died worse on the former than on the latter. Though these results were obtained,

the cabbage were diseased when cut and weighed and were worth practically nothing on the market, the most of them being thrown to hogs.

Commercial cabbage.—One acre of land in a back field was fertilized on February 1st with about 1,500 pounds of cotton seed, the germs of which had been killed by mixing the seed with acid phosphate and exposing them in heaps to the weather. These cotton seed were applied in the drill and listed upon when a mixture of two parts acid phosphate and one part of cottonseed meal, at the rate of 1,000 pounds per acre was applied on top of the list and harrowed into the soil. The beds were then completed and Jersey Wakefield cabbage plants set out on the 13th of February. These plants grew off nicely and were twice given a top dressing of nitrate of soda at the rate of 50 pounds per acre. The cabbage suffered some for want of rain, but made a fair yield of first class heads. All told, the Station sold ninety standard size crates of cabbage, the most of which came from this commercial patch. Sixty-four crates of these cabbage brought shippers net returns of \$119.80, the remaining twenty-six crates, which were shipped later, bringing only \$4.05, on account of having reached the market in a reported bad condition. A few cabbage plants set out in the fall of 1905 matured good heads early in 1906 which were sold locally at good prices. These cabbage were set out on September 28th from plants that had been grown in the cold frame. We began selling them on January 11th and sold from .22 of an acre about forty dollars worth of cabbage. Cabbage were set out again in the fall of 1906, but the seasons were unfavorable at the time and the most of the plants died. Those that lived made some good heads which were ready for market at Christmas. If well rooted, young cabbage plants seem to stand the lowest temperatures of the winters here without injury, the indications are that if planted early in December, they not only make larger yields, but sell for much better prices than when planted in February. Then, too, the soils here are so mellow that young plants can safely be covered with dirt during the severe cold spells and uncovered a few days later. This has been tried successfully here several times.

Beans (*fertilizer tests*).—On April 2d ten plots of 1-16 acre each on the natural soil and two plots of the same size on the parked land were fertilized in as many different ways and planted to beans, using the Valentine, a green podded variety. Picking was begun on May 29th and ended June 14th with results as follows, calculated from 1-16

to acre yields: 225 pounds of cottonseed meal and 110 pounds of nitrate of soda gave 77.3 bushels; 512 pounds of acid phosphate gave 86.9 bushels; 480 pounds of kainit gave 58.1 bushels; 512 pounds of acid phosphate and 480 pounds of kainit gave 63.5 bushels. On the other plots the following mixture was taken as a unit application per acre: 225 pounds of cottonseed meal, 112 pounds of nitrate of soda, and 456 pounds of acid phosphate, and 200 pounds of kainit. This mixture gave a calculated yield of 130.6 bushels of beans on the natural soil and 106.6 on the parked area; the same mixture except for having kainit left out, gave 124.8 bushels on the natural soil and 118.7 bushels on the parked area; with nitrogen and potash normal and phosphoric acid left out entirely the yield was 86.4 bushels; one-fourth the unit application gave a yield of 110.4 bushels, both the last results being on the natural or unparked soil.

In addition to the test plots the Station grew two acres of wax beans on the best type of soil, well fertilized. These beans were sprayed twice with Bordeaux mixture to keep down anthracnose, or rust of the pods. However, with all this, the beans rusted so badly that they were not worth gathering and the crop proved an entire failure. Except for the first year, beans have not proven a profitable crop here—they have never been grown in large enough quantities to ship by freight and what profit there might be in them usually goes to pay express charges. The green bean is decidedly the most reliable kind to grow here for they are seldom affected seriously by anthracnose and sell almost as well on the markets as the wax bean.

Irish potatoes (*fertilizer test*).—Six plots of land of 1-16 acre each and six of 1-20 acre each were devoted to tests with fertilizers under Irish potatoes. This included five combinations of fertilizers and one blank plot on both parked and unparked land. The potatoes came up to a very poor stand, and notwithstanding the seasons were good, all yields were too poor and irregular to be worth reporting. Maine grown Red Triumph seed were planted on all test plots and also on one acre of land for commercial purposes. Even when the stand of potatoes was good, the yields were very poor. The acre grown for commercial purposes was first given an application of cotton seed and acid phosphate some time before planting; just before planting a mixture of cottonseed meal, nitrate of soda, and acid phosphate was applied, and later, while the potatoes were growing, nitrate of soda was used as a top dressing. These potatoes came up to a good stand

but the acre only yielded 44 bushels of first grade and 18 bushels of second grade potatoes. Four tests to show the effects on the yields of planting different size seed pieces were conducted, but resulted about as reported with the tests with varieties, the poor stand and indifferent growth of the potatoes making the tests of no value. All these potatoes were sprayed twice during the growing period with Bordeaux mixture containing enough paris green to keep down the potato beetle, and we can only attribute the poor results to indifferent seed, or to the fact that Maine grown seed were not suited to this climate.

Irish potatoes (*variety test*).—During the first days of February a plot of land containing twenty rows, each three feet wide and three hundred feet long was fertilized with a mixture containing 100 pounds of nitrate of soda, 200 pounds of cottonseed meal, 400 pounds of acid phosphate, and 200 pounds of kainit, applied at the rate of 20.7 pounds per row, or about 1,000 pounds per acre. Four varieties of potatoes were immediately planted in alternating rows, to do away as nearly as possible, with the effects of inequalities in the soil. The Triumph potatoes in this test did not come up to a perfect stand, while the other three varieties did. By counting an average row of each variety, we estimated that the Triumph had 84% of a stand considering the stand of the others perfect. The Triumph potatoes were dug on May 29th and the three other varieties on June 11th, giving yields as follows, calculated in bushels per acre: Triumph, 39.8 bushels of first grade and 3.5 bushels of second grade; Early Rose, 100.8 bushels of first grade and 13 bushels of second grade; Burbank, 96.8 bushels of first grade and 14.7 bushels of second grade; Peerless, 104.5 bushels of first grade and 14.6 bushels of second grade.

Remarks.—The Irish potato has never proven a profitable crop here, except for one year, and then only in a small way. Unless the land is highly developed seventy-five to one hundred bushels per acre of first grade potatoes is as good a yield as can be expected. They require a heavy fertilization, the seed are expensive, they must be sprayed at least twice to keep down the potato beetle, and unless gotten on an early market the chances are that the margin of profit between the cost of production and the selling price will be extremely close. The one redeeming feature about the crop is that it only occupies the land a short time, leaving it in good condition for corn, cowpeas, or sweet potatoes. Some of the best yields of the three crops mentioned ever obtained here, were when they followed Irish potatoes.

Tomatoes.—Three-fourths of an acre of land devoted heretofore to tillage tests with cotton and corn was prepared and fertilized at the rate of 500 pounds per acre of a fertilizer made by mixing together one part of sodium nitrate, two parts of cottonseed meal, and four parts of acid phosphate. On March 23d one half of this land was planted to tomatoes from cold frame and the other half was planted from a hotbed. Not more than two-thirds of a stand was obtained and the chief object in growing them at all was to determine whether or not it was possible to make a success of the crop here by spraying regularly to keep down black rot. These tomatoes were sprayed twice with Bordeaux mixture before they were stuck, on April 13th and 23d, using a barrel spray pump; the first application was immediately washed off by a heavy rain. They were sprayed twice after sticking, on May 19th and June 25th, using a knapsack spray pump. The vines were stuck on May 10th and picking began on June 6th and was continued until July 18th. The first tomatoes had some rot among them, but were much better than we had ever grown before, later they began rotting badly when an application of Bordeaux mixture checked the rot almost entirely. A great many tomatoes were ruined by worms, still more of them rotted, and the vines were never so thrifty as they had grown here in former years, still 170 4-basket crates were sold which brought shippers net returns of \$94.67. The tomato can be grown here successfully, but only by spraying regularly to keep down the fungus which causes them to rot.

Other vegetables.—Such crops as beets, onions, lettuce and radishes can be grown here very successfully, but the matter of making them profitable depends a great deal on when and how they are marketed. On October 6, 1905, .17 of an acre of land was planted to Egyptian Blood Turnip Beets; these came up to only a fair stand and the missing places were filled in by transplanting the young beets. Up to April 30th, 27 bushels of beets were sold from this land for a shippers net returns of \$15.15. On October 10, 1906, the same variety of beet was planted again and has done unusually well. They were ready for market on January 15th. Onions from seed and sets have been grown here through two winters and fresh onions have been sold all through the winter months. When left to mature, these onions have made fine bulbs.

STAPLE CROPS.

Cotton (fertilizer tests).—Thirty plots of 1-20 acre each, the same that have been used for this work for two years previously, were used

in conducting tests with fertilizers under cotton. Only ten different tests, however, were conducted, each being made in triplicate. This land was fertilized in the drill on April 3rd, the fertilizer mixed with a plow and listed upon. On April 16th, the beds were completed and Cook's Improved cotton seed dropped by hand. Plots fertilized alike were so located as to give each fertilizer, as nearly as possible, equal advantage as to location, and to do away with the discrepancies that might be due to variations in the soil itself. The average yields were as follows, calculated in pounds per acre of seed cotton: no fertilizer, 480 pounds; 100 pounds of cottonseed meal, 760 pounds; 100 pounds of acid phosphate, 800 pounds; 100 pounds of kainit, 620 pounds; 100 pounds acid phosphate and 100 pounds of cottonseed meal, 1,060 pounds; 200 pounds cottonseed meal and 100 pounds of acid phosphate, 1,040 pounds; 100 pounds of cottonseed meal and 200 pounds of acid phosphate, 1,000 pounds; 100 pounds cottonseed meal and 100 pounds of raw ground phosphate rock, 840 pounds; 100 pounds of cottonseed meal and 500 pounds of New Jersey Green Sand Marl, 620 pounds; 100 pounds of acid phosphate, 100 pounds of cottonseed meal, and 100 pounds of kainit, 860 pounds. Four plots were used on the parked land and fertilized in two different ways, the work being duplicated. The main object of this particular work was to find if the addition of kainit to cottonseed meal and acid phosphate would increase the yield of cotton. The four plots used were each 1-20 of an acre in size and the average results were as follows, calculated in pounds of seed cotton per acre; 100 pounds of acid phosphate and 100 pounds of cottonseed meal gave 1,540 pounds of cotton; and 100 pounds of acid phosphate, 100 pounds of cottonseed meal and 100 pounds of kainit gave 1,485 pounds of seed cotton. These results also show that the effects of manure left by cattle in the winter of 1902-3 are still quite perceptible.

Cotton (variety tests).—During the first days of April a plot of land consisting of 76 rows each $3\frac{3}{4}$ feet wide and 150 feet long was prepared for varieties of cotton and fertilized at the rate of 300 pounds per acre of a mixture of two parts acid phosphate and one part cottonseed meal. On April 17th nineteen varieties of cotton were planted on this land in single rows, each variety having four rows in different parts of the field. This was done to do away with the effects of inequalities of the soil which might have interfered with the reliability of the results had all four of the rows of each variety been placed together. Each row was picked and weighed separately and the

sum of the four rows multiplied by twenty to reduce each variety to acre yields. The following are the results, calculated in pounds of seed cotton per acre: Cook's Improved, 1,385 pounds; Culpepper, 1,300 pounds; Cleveland's Big Boll, 1,265 pounds; Hunnicutt's Big Boll, 1,260 pounds; Toole's Improved, 1,245 pounds; Rogers', 1,220 pounds; Florodora, 1,210 pounds; Peterkin's Improved, 1,195 pounds; Lewis' Prize, 1,185 pounds; Russell's Big Boll, 1,180 pounds; Peterkin, 1,180 pounds; Hagerman, 1,165 pounds; Hawkins' Extra Early Prolific, 1,165 pounds; Texas Bur, 1,140 pounds; Pride of Georgia, 1,190 pounds; Southern Hope, 1,065 pounds; Texas Wood, 1,050 pounds; Sunflower, 1,030 pounds; Willet's Red Leaf, 975 pounds. An attempt was made to determine the percentage of seed and lint in the several varieties of cotton but the only gin available was in such condition that the tests would have been worthless.

The seed used were obtained as follows: Pride of Georgia, Sunflower, Culpepper, Texas Wood, Southern Hope, Rogers, and Hagerman, from the United States Department of Agriculture, Washington, D. C.; Cook's Improved from J. R. Cook, Ellaville, Ga.; Texas Bur, from C. E. Smith, Locust Grove, Ga.; Peterkin, Hunnicutt's Big Boll, Toole's Improved, and Florodora, from Amzi Godden Seed Co., Birmingham, Ala.; Hawkins' Extra Early Prolific, Peterkin's Improved, and Russell's Big Boll, from T. W. Wood & Sons, Richmond, Va.; Cleveland's Big Boll, from J. R. Cleveland, Decatur, Miss.; Lewis' Prize, from W. B. F. Lewis, Lewiston, La.; Willet's Red Leaf from N. L. Willet Seed Co., Augusta, Ga.

Corn (*fertilizer tests*).—Thirty plots of land of 1-20 acre each were devoted to this test. The land had previously grown two crops of corn and these had been followed each year by cowpeas, so that its supply of nitrogen was greater than with plots, near by, on which the work with cotton was conducted. Instead of using thirty different fertilizers here, only ten tests were made and these were triplicated. The average yields are reported in bushels of shelled corn, calculated to the acre: no fertilizer, 14.6 bushels; 100 pounds of cottonseed meal, 23.6 bushels; 100 pounds of acid phosphate, 28.3 bushels; 100 pounds of kainit, 18.6 bushels; 165 pounds of ground bone, 27.7 bushels; 90 pounds of cottonseed meal and 414 pounds of lime and acid phosphate mixture (furnishing reverted phosphoric acid), 26.4 bushels; 100 pounds of acid phosphate and 100 pounds of cottonseed meal, 26.2 bushels; 100 pounds of cottonseed meal and

200 pounds of acid phosphate, 25.1 bushels; 200 pounds of cottonseed meal and 100 pounds of acid phosphate, 27 bushels; 100 pounds of cottonseed meal, 100 pounds of acid phosphate, and 100 pounds of kainit, 28.6 bushels.

Two tests on the parked land, conducted in duplicate, gave yields as follows, calculated as above: 100 pounds of acid phosphate and 100 pounds of cottonseed meal, 36.5 bushels; 100 pounds of cottonseed meal, 100 pounds of acid phosphate, and 100 pounds of kainit gave 33.3 bushels.

Corn (*variety tests*).—The land used for this test was the same that had been used the year before for a similar test with corn, the same having been followed by a crop of cowpeas. Previous to fertilizing this land it had been broken and laid off into rows $3\frac{3}{4}$ feet apart. On April 4th these rows were fertilized in the drill with a mixture of equal parts of acid phosphate and cottonseed meal, at the rate of 300 pounds per acre, and on April 5th, eleven varieties of corn were planted, each variety occupying a single row and being repeated four times in the test. The rows were 300 feet long and the sum of the four allotted to each variety were calculated to acre yields by multiplying by ten. These results were as follows, calculated in bushels per acre: Cocke's Prolific, 35.3 bushels; Eureka, 35.1 bushels; Mosby's Prolific, 32.8 bushels; Early Breadfield, 32 bushels; White Majestic, 29.7 bushels; Improved Southern White Snowflake, 28.7 bushels; Improved Leming, 28.6 bushels; Holt's Strawberry, 27.3 bushels; Improved Golden Dent, 27.3 bushels; Blunt's Prolific, 24.1 bushels; Hickory King, 23.6 bushels.

Corn (*improving tests*).—The Station began in 1905 to improve a variety of corn and at that time grew one half acre of Mosby's Prolific corn, from which, in the fall, ears were selected from stalks producing at least two good ones. In 1906, the best ears from the ones selected then were taken and planted where the corn could not mix with other varieties. Just as it was ready to tassel, it was gone over and the undesirable stalks emasculated. This corn made a fine yield, nearly every stalk producing two good ears. When ripe seed were again selected only from the stalks producing two or more of the best ears. It is thought that considerable improvement has already been effected and we hope to keep up this work until a well bred corn, suited to local conditions, has been developed.



CORN PLAT.

Remarks.—The Station grows practically all the corn consumed on the place by nine head of horses and mules, besides a great deal of corn which is fed to hogs. Practically all this corn, except that grown on test plots, is planted after vegetables. There were sixteen acres planted to corn in 1906 and on ten of these it followed some other crop. From these sixteen acres we weighed 439.4 bushels of corn.

Oats.—One acre of land was fertilized on September 26th with a light application of stable manure and 400 pounds of a mixture of equal parts acid phosphate and cottonseed meal, oats and vetch were immediately sown on the land in the proportion of four parts of oats to one part of vetch. In the spring these crops were given a top dressing of nitrate of soda at the rate of 100 pounds per acre and the same was worked into the land with a smoothing harrow. Both crops did well and were cut on April 30th and weighed May 7th, giving 6,090 pounds of well cured hay. After cutting, the land was immediately prepared and planted to Mosby's Prolific corn on May 25th. Thirty bushels of corn were gathered from this acre and a fair crop of cowpeas were turned under when this same land was prepared in the fall for strawberries. The rust proof oat planted in the fall is decidedly the best variety for this section.

Vetch.—All the vetch mentioned in the last report as having been planted here in the fall of 1905 made a fine growth. Some of

this was cut for hay and other patches left to reseed itself on the land. A good quality of hay was obtained at the rate of about 1000 pounds per acre, while that allowed to form seed came up in the fall to a perfect stand.

Other legumes.—Further work has been done with alfalfa and the conclusion reached that it will not be a profitable crop for this section. That grown from seed sown in the fall of 1905 was choked out by crab grass during the past summer, and another lot sown in the fall of 1906 failed to come up to a stand and the land was afterwards planted to cabbage. The burr clover sown in 1905 made a few seed in the spring and these were turned under when the land was prepared for other crops. This same land was sown to oats in the fall of 1906 and a fair stand of burr clover came up with the oats. This, however, lacked vitality and unless the land is inoculated it is hardly worth while to attempt to grow this crop. Some burr clover planted around the house has done nicely and is spreading each year.

Sugar cane (*fertilizer tests*).—Two different tests, showing the effects of fertilizers on the yield of sugar cane, were conducted, one with stubble cane and the other with plant cane. The work with fertilizers under plant cane was conducted on 1.25 acre plots and there were two of these plots to each test. The following is the average yield of cane, calculated in pounds per acre: no fertilizer, 31,425 pounds; 200 pounds of cottonseed meal and 200 pounds of acid phosphate, 36,325 pounds; 200 pounds of cottonseed meal, 200 pounds of acid phosphate, and 100 pounds of kainit, 35,800 pounds; 400 pounds of cottonseed meal, and 200 pounds of acid phosphate, 39,950 pounds; 200 pounds of cottonseed meal and 400 pounds of acid phosphate, 36,950 pounds; 400 pounds of cottonseed meal and 400 pounds of acid phosphate, 36,325 pounds.

The work with fertilizers under stubble cane was conducted on the same plots used the year before for fertilizer tests with plant cane, and is merely a repetition of that work. A mixture containing 210 pounds of cottonseed meal, 210 pounds of acid phosphate, and 90 pounds of kainit was taken as a unit application and gave a calculated yield per acre of 33,856 pounds of cane; when the acid phosphate in the above mixture was doubled the yield was 41,536 pounds; double the unit application, one half applied on May 16th and the other half on July 10th, gave 41,984 pounds; double the unit application, all applied May 16th, gave 40,896 pounds; when the cottonseed meal and acid phosphate were normal and the kainit left out entirely, the

yield was 33,920 pounds; one half the unit application gave 33,856 pounds; four times the unit application gave 45,312 pounds; no fertilizer gave 31,744 pounds; doubling the nitrogen and leaving the phosphorus and potassium normal, gave 36,032 pounds. The results obtained with the stubble cane will average fifty per cent. less than the yield obtained last year on the same plots with plant cane.

Remarks.—The Station made between 1,100 and 1,200 gallons of syrup last year and put up 1,000 gallons in ten pound screw-top cans. This syrup in cans kept perfectly and a few gallons on hand at this time is just as good molasses as when first made, while other syrup put up in jugs soured and was unfit for use by the middle of last summer. Practically all of the syrup in the cans was sold at from fifty to fifty-five cents per can, while a great deal of that in the jugs had to be boiled over in the fall of 1906. Practically all of the cane grown in 1906, except about one acre which was injured by frost, was used for seed and some ten acres of additional cane was planted in the fall. The acre mentioned was ground and the syrup put up in three-pound cans with soldered tops. This three pound can is a more popular package than the ten pound can, but a good deal more effort is required to handle them.

Peanuts and chufas.—No particular tests were conducted with these crops, but several acres of each were grown, a good many of each were saved for seed, and a large part of the peanut vines cured and saved for hay. The peanut is not regarded so highly here as the chufa; in the first place they do not yield so well, and in the second, the drop will not wait when ripe for a convenient season, and unless planted in a field to themselves where they can be grazed off by hogs when mature, the nuts sprout in the ground and are seriously injured. Chufas grow here to perfection and will lie in the ground all the fall and winter without rotting or sprouting. Artichokes have never done well here and three trials with them have convinced us that it is not a profitable crop for this section.

Sweet potatoes (fertilizer tests).—Ten tests with fertilizers under sweet potatoes were conducted. The work was done on 1-20 acre plots and every experiment was duplicated, the duplicate plots being so located as to avoid errors, as far as possible, which might be due to differences in the soil. The following is the average of each test, calculated in pounds of potatoes per acre: no fertilizer, 13,550; 200 pounds of cottonseed meal, 14,320; 200 pounds of acid phosphate,

16,000; 200 pounds of kainit, 14,490; 150 pounds of cottonseed meal and 150 pounds of acid phosphate, 14,820; 150 pounds of cottonseed meal and 300 pounds of acid phosphate, 15,550; 300 pounds of cottonseed meal and 150 pounds of acid phosphate, 14,830; 150 pounds of cottonseed meal and 150 pounds of kainit, 14,300; 150 pounds of acid phosphate and 150 pounds of kainit, 14,910; 150 pounds of cottonseed meal, 150 pounds of acid phosphate and 150 pounds of kainit, 15,910.

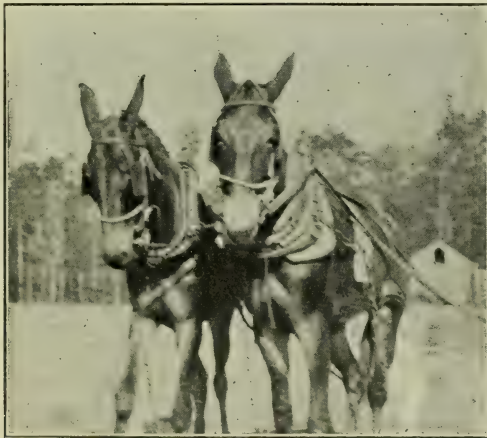
Remarks.—The potatoes from this one acre of land above mentioned, were put in sacks as they were dug and were shipped at once to Birmingham without re-handling, where they were sold at 54 cents per bushel, f. o. b. McNeill. The acre yielded 247 bushels of marketable potatoes and 23 bushels of seed potatoes. Several acres of land in the young peach orchard were planted to sweet potatoes, but did not yield so well, largely because, with stumps and peach trees both to contend with, the potatoes were poorly worked and not more than half the land was actually devoted to them. We shipped all told 720 bushels of sweet potatoes which brought shippers net returns of 355.79, only a few white and a few cut potatoes selling for less than 50 cents per bushel, f. o. b. our station. Hogs were allowed to graze over practically all of this potato land, and except on the test plots, no special effort was made to get all of the potatoes.

Cowpeas (*fertilizer tests*).—Three tests were conducted on duplicate plots to show the effect of fertilizers under cowpeas. The six plots used were each 1-20 of an acre in size and were fertilized on May 16th and immediately planted to the Unknown cowpea. All the peas were first picked from the vines before these were cut and cured for hay. Practically all leaves had fallen from the vines before the last peas ripened. The average results, calculated in pounds per acre, were as follows: 200 pounds of acid phosphate gave 1200 pounds of peas in hull and 840 pounds of hay; 200 pounds of kainit gave 1,220 pounds of peas in hull and 840 pounds of hay; a mixture of 200 pounds of acid phosphate and 200 pounds of kainit gave 1,330 pounds of peas in hull and 820 pounds of hay. No blank plot was carried.

Cowpeas (*variety tests*).—Ten varieties of cowpeas were planted June 13th on a uniform piece of land that had just been fertilized with acid phosphate at the rate of 200 pounds per acre. The rows were each three feet wide and 148 feet long and there were six rows planted to each variety. Instead of having all these rows together in one plot they were distributed regularly over the entire piece of land devoted to

the test. The vines were cut on August 30th and weighed September 3d, moisture was determined in each variety as weighed, the results here reported being given in pounds per acre of air dried hay. The following were the yields: Wonderful, or Unknown, 4,200 pounds; Red Ripper, 3,504 pounds; Iron, 3,329 pounds; Clay, 3,043 pounds; New Era, 2,902 pounds; Whippoorwill, 2,822 pounds; Red Caroline, 2,783 pounds; Black, 2,715 pounds; Taylor, 2,595 pounds; Large Black Eye, 2,464 pounds.

Remarks.—Cowpeas are made to follow all corn grown here and also any other crops that it is possible to plant them after and the vines are usually saved for hay. Tests have shown that they have a wonderful effect here, especially in connection with phosphate, in building up the soils and in supplying nitrogen necessary to other crops. The hay saved from the vines furnishes practically all of the roughness used by the Station's live stock and frequently this hay is made to take the place of corn in the feed for horses and mules. If more cowpeas were grown it is confidently believed that the problem of fertilizing these pine soils would be reduced to a simple proposition of furnishing them phosphorus from acid phosphate and perhaps from the raw ground phosphate rock.



HOME-RAISED MULE COLTS.

Live stock.—The Station has continued to raise mule colts, though only in a very small way, as only two mares have been kept and one of these has failed to breed from the start. The other one has raised a mule colt every year for the past three years and is due to foal again

in the early spring. The two oldest colts (one from a mare that died) have been trained to work, and are now, at a little less than three years old, of good size and able to do as good farm work as any team on the place. The accompanying illustration shows these two young mules just after we began working them as two-year olds. During the year the jack served 26 mares, including the two belonging to the Station. This jack has been recently exchanged with the Holly Springs Branch Experiment Station for a thoroughbred stallion, and horse, instead of mule colts, will be raised in future.

Rotations.—There are four plots in this experiment, each $\frac{1}{2}$ acre in size. One half of each plot is fertilized every year and the other half has been left unfertilized (except the cowpeas following oats have been fertilized with acid phosphate beginning in 1905). This work began in 1903, and the rotation, being a 3 year - 5 crop system, each plot grew in 1906 the same crop that had been grown in 1903. The fertilized halves of these plots yielded as follows, calculated in pounds per acre: plot 1, 2,568 pounds of oat hay in 1903 and 2,800 pounds in 1906; plot 2, 1,520 pounds of corn in ear in 1903 and 1,940 pounds in 1906; plot 3, 1,118 pounds of seed cotton in 1903 and 1,312 pounds in 1906; plot 4 (growing cotton continuously), 1,120 pounds of seed cotton in 1903 and 936 pounds in 1906. The unfertilized halves of the plots (except that cowpeas following oats received acid phosphate at the rate of 200 pounds per acre in 1905-06) yielded as follows, calculated in pounds per acre; plot 1, 1,560 pounds of oat hay in 1903, and 1,840 pounds in 1906; plot 2, 800 pounds of corn in ear in 1903, and 560 pounds in 1906; plot 3, 500 pounds of seed cotton in 1903 and 710 pounds in 1906; plot 4 (growing cotton continuously), 558 pounds of seed cotton in 1903 and 360 pounds in 1906. The significant fact is developed that by rotating our crops and fertilizing same, the productive capacity of the soil may be increased seventeen per cent. in three years, while by growing cotton continuously on the land its productive capacity is reduced sixteen per cent in the same length of time. A further fact is brought out that unless some fertilizer is used on these soils the cowpeas in the rotation will not thrive and cannot be made to increase the crop producing power of the soil.

Mississippi Agricultural Experiment Station.

BULLETIN No. 102.

How to Control Injurious Insects and Noxious Plant Diseases.

By GLENN W. HERRICK.

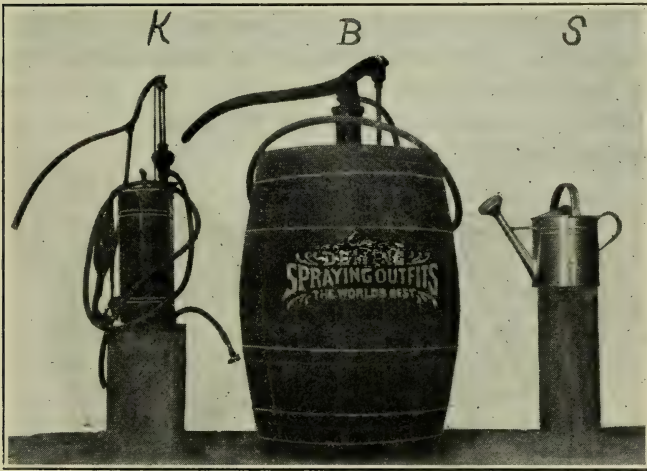


FIGURE 1—SPRAYING MACHINES.

S, hand sprinkler; K, knapsack; B, barrel sprayer.

AGRICULTURAL COLLEGE, MISS.

APRIL, 1907.

THE CONTROL OF INJURIOUS

INSECTS AND PLANT DISEASES.

Introduction.—There is, in this State, a steadily increasing demand for information concerning methods of spraying and materials to use in combating injurious insects and noxious plant diseases. This bulletin is prepared in response to such a demand and is an attempt to set forth in a simple, plain way the preparation and use of a few of the leading insecticides and fungicides.

INJURIOUS INSECTS.

The two great groups of insect pests.—There are many kinds of insects that pester the farmer and fruit grower and all of them, taken together, may be divided into two great groups dependant upon the kind of mouth parts they have and the manner in which they attack plants. The insects of one group have jaws and bite off bits of plants and swallow them. They are known as the *biting insects*. The members of the second group have a bill or sucking tube which they insert into the tissues of plants and suck out the juices. These are known as the *sucking insects*.

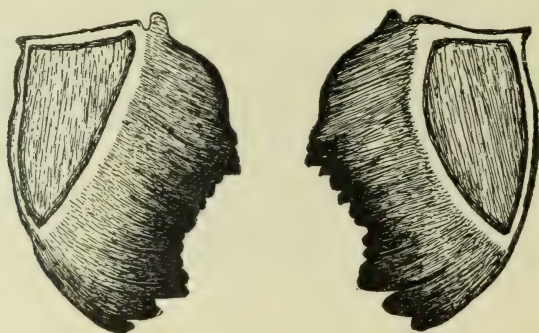


FIG. 2—THE BITING JAWS OF A GRASSHOPPER.

Insects that bite.—The grasshopper is a familiar example of the first class of insects, for it has biting mouth parts, composed of two pairs of jaws, one of which is hard and black and easily seen with the eye (Fig. 2). With these jaws the grasshopper bites off pieces of leaves, stems, etc., and swallows them much as a cow or horse would do. Very many insect pests have biting mouth parts like the grasshopper and eat parts of plants. For example, the caterpillars, or "worms," on cotton, tomatoes, cabbage, etc., the June bugs, fig-eaters, potato bugs, etc. All such insects are known as the *biting insects*.

How to fight the biting insects.—It is plain that an insect that persistently bites off pieces of leaves and swallows them stands a relatively high chance of being killed by putting some poisonous substance upon the leaves before they are eaten. After one determines that the pest causing the trouble bites and eats the plant, it will become necessary to decide what poison is best to use and how and when it is best applied.

Insects that suck the plants.—The squash bug, and the terrapin bug are examples of the other class of insects that suck the juices from plants, but do not bite off pieces of the plants and swallow them. If we look closely at a large squash bug we will find projecting from the under side of its head a long, slender beak. The same kind of a beak may be found on the head of a "terrapin bug," on the little green and black plant lice, and on the "stink" bugs. This little beak forms a tube which is forced into a leaf or stem and serves as a pipe through which to draw the sap into the mouth (Fig. 3).



FIG. 3—A BUG WITH SUCKING TUBE.

How to fight sucking insects.—Since these insects draw their food from the inside of a plant, it is evident that no amount of poison placed on the leaves or stems of those plants would affect the insects because the latter would not get any of the poison. Such insects may be killed by putting something like oil, tobacco, soap, or sulphur on their bodies. We usually speak of this method of killing insects as the *contact* method.

Importance of knowing the kind of insect causing the trouble.—It is absolutely necessary to know what kind of an insect is causing the injury,—whether it is a biting or sucking insect. So this is the first

point to determine. If the pest is a biting insect then some poison sprayed upon the plant attacked will usually be the best remedy. If the pest is a sucking insect, then something must be used that can be sprayed upon the body of the insects to kill them.

SUBSTANCES FOR KILLING BITING INSECTS.

Paris green.—Probably Paris green is one of the best known poisons for biting insects. It is rather expensive, difficult to buy unadulterated and is quite liable to burn the foliage of plants if applied too strong.

It can be applied dry as follows:

- 1 pound of Paris green,
- 25 pounds of slaked lime or flour.

The two should be thoroughly mixed and may be sifted on the plants from a thin muslin sack, preferably in the morning while the dew is yet on.

Paris green may also be applied in water which we believe is a better method than the dry one for most plants. Quick lime is added to prevent burning of the foliage and the poison is used in the following proportions:

- 1 pound of Paris green
- 200 to 300 gallons of water
- 3 pounds quick lime.

Slake this lime in a little water and add the Paris green. Stir thoroughly and then add the proper amount of water,—for potatoes 200 gallons of water, and for peach, 300 gallons.

Arsenate of lead.—This is a combination of arsenic and acetate of lead and is better than Paris green because it sticks to the foliage better, will not burn the leaves, and remains in suspension longer. It can be made as follows:

- 11 ounces acetate of lead (white sugar of lead)
- 4 ounces arsenate of soda
- 50 gallons water.

Dissolve the acetate of lead in 4 quarts of water and the arsenate of soda in 2 quarts of water. Pour them together, mix thoroughly and then dilute with 50 gallons of water. It is then ready to use at once.

Arsenate of lead can be bought ready prepared and is very convenient to use. It should be used at the rate of 4 to 6 pounds of the arsenate of lead to 100 gallons of water.

Arsenite of lime.—White arsenic is cheap, easy to get, and is not often adulterated. Therefore, when it is combined with lime or sal soda to prevent burning of the foliage, it is a most satisfactory insecticide.

It may be prepared as follows:

- 1 pound white arsenic
- 4 pounds quick lime
- 4 gallons water.

Boil the lime and arsenic together in the water for half an hour and then dilute with 200 gallons of water for spraying.

Arsenite of lime may also be prepared according to the Kedzie formula which consists in boiling *two pounds of white arsenic* and *eight pounds of sal soda* in **two gallons of water** for 15 or 20 minutes, or until the arsenic and soda are dissolved. This constitutes a *stock solution* which may be kept in a sealed jug for a long time. When ready to spray slack two pounds of quick lime, take one pint of the stock solution and mix them both with 40 gallons of water.

Carbon Bisulphide for grain insects.—Stored corn, peas, beans, etc., are often attacked by weevils and the tiny caterpillars of the small Anguimoid grain moth. These insects can be killed by fumigating the grain with carbon bisulphide, a heavy liquid that quickly evaporates when exposed to the air and forms a heavy gas that settles downward amongst the grain and kills all insect life.

The bins or receptacles holding the grain must first be made as tight as possible, the tighter the better. If made sufficiently tight, a pound of the liquid to every 100 bushels of grain would be sufficient. Usually more than this is needed. The liquid may be poured directly on to the grain, or it may be placed in shallow dishes which are set on top of the grain and allowed to stand for 36 to 48 hours while the openings of the bin are all tightly closed. The gas is highly inflammable and fire in no form should be brought near the place being fumigated. A lighted match, cigar, lantern or candle should not be brought near the grain until the bin or receptacle has been opened and thoroughly aired.

In treating seed corn or peas it is best to pour the liquid in shallow dishes to evaporate because it might destroy the germinating power of the seed if poured directly on the grain.

A very good way to keep seed peas is to store them in a tight barrel leaving about three inches of unfilled space at the top. Then about three times during the storage season pour a half teacupful of carbon

bisulphide in a shallow tin dish and set it on top of the peas, cover with a heavy sack or blanket and allow it to stand 48 hours. Tight, empty dry goods boxes serve equally as well and will do nicely for storing seed corn. The best success with corn will be obtained by removing the shucks before it is stored. The gas from the carbon bisulphide will reach the weevils more surely.

SUBSTANCES FOR KILLING SUCKING INSECTS.

As already explained, some substance is used for sucking insects that when applied to their bodies will kill them by contact.

Oil emulsion.—Perhaps the best substance for combating sucking insects is an emulsion of kerosene oil and soap which may be made after the following formula:

2 lbs. hard or soft soap

4 gallons of soft water

8 gallons of kerosene oil.

Place the soap (if hard soap is used it should be shaved in fine pieces) in the water over a fire and heat until it is thoroughly dissolved. Pour the oil into the barrel in which the spray pump is sitting, and when the water and soap are boiling hot pour them into the barrel with the oil. Pump the mixture vigorously back into itself by directing the hose into the barrel after the cap of the nozzle has been removed. Direct the stream from the hose downward so that all the mass will be agitated. It will probably take ten or fifteen minutes of vigorous pumping to make a creamy, white emulsion. When the emulsion is obtained add enough water, to make 80 gallons of mixture. This will give a ten per cent. solution, which is a safe one for summer use. When water is poured into the emulsion it may not mix readily. In this case, direct the hose into the barrel again, and pump back into the mixture as was done at first. If, for any reason, the soap and oil fail to emulsify, the whole batch might as well be thrown away and another attempt made. Care must be taken to use rain water or some soft water.

This emulsion may be made of sour milk if desired at the rate of 1 gallon of the milk to 2 gallons of kerosene oil. After these are thoroughly mixed they should be diluted with 17 gallons of water. This is a good remedy for plant lice.

Whale-oil soap.—This soap can be obtained from large dealers in cities and can be ordered by the home merchants. It is a splendid remedy for plant lice and should be used at the rate of one pound to 5 or 6 gallons of water. The soap will have to be dissolved in hot water.

Tobacco Solution.—This is a wash or solution made by boiling one pound of tobacco leaves in 4 gallons of water for one-half an hour. If any of the water boils away, add enough, when through boiling, to make 4 gallons.

This solution will be improved by adding one-fourth of a pound of whale-oil soap.

Lime-salt-sulphur wash for scale insects.—This is a wash composed of lime, salt and sulphur in the following proportions:

20 lbs. Quick lime,
15 lbs. Sulphur,
10 lbs. Salt,
45 gals. Water.

Only the very best quality of quick lime should be used. Two iron kettles should be procured, each holding at least 20 gallons, but the more they hold the better. The 20 pounds of lime should be slaked in three or four gallons of hot water in one of the kettles. When the lime is nearly slacked, but before it quits boiling, add the fifteen pounds of sulphur and enough hot water to make a thin paste of the lime and sulphur. Stir the whole vigorously until they are thoroughly mixed, and then boil actively for 45 minutes. After the lime and sulphur have *actually boiled 45 minutes* add the ten pounds of salt, and boil vigorously 15 minutes more. It will become necessary during the boiling to add a little hot water now and then to keep the Mixture thin. When through boiling add enough hot water to make 45 gallons, strain through a gunny sack, and apply hot.

Two of the kettles spoken of above are intended to furnish a cooking outfit for a small orchard, say of a thousand trees. If one has a large orchard and is obliged to make this mixture on a large scale, it will be more economical to buy a boiler of 15 or 20 horse power. A discarded threshing engine that is capable of standing a pressure of 5 or 6 pounds of steam will answer admirably. The boiler should be connected with half a dozen barrels, or more, if desired. Some of the barrels may be used for cooking the wash and some for heating the water. In this way two or three wagons, each carrying a 45-gallon barrel spray pump, may be kept at work with no loss of time. It will be found most satisfactory to have the barrels mounted on a platform three or four feet high. Of course the mixture is made in the same manner and in the same proportion as when the kettles are used.

Persian Insect Powder, Buhach, or Pyrethrum for Mosquitoes and Flies.—Buhach is a powder made by pulverizing the blossoms of a

plant now grown largely in California. When it can be obtained fresh at the drug store it is a splendid remedy for ridding the house of flies and mosquitoes. To do this, close all the windows and doors at night and sprinkle the powder about the window casements, on the tables and throughout the room. In the morning the dead and stupefied flies should be swept up and burned, else the latter might revive. Buhach is not poisonous and is perfectly harmless to human beings.

Buhach, or pyrethrum is also good for lice on cattle, horses, and hogs. It should be thoroughly dusted all over the animals.

Oil and Sulphur for cattle ticks and lice.—To rid cattle of ticks they should be smeared with a mixture of 1 gallon of kerosene oil, 1 gallon of cottonseed oil, and 1 pound of sulphur. The mixture may be applied with a brush or mop.

This mixture is also a good remedy for lice on cattle.

The kerosene emulsion already described is a good remedy for lice on cattle and hogs.

Ordinarily, kerosene oil may be used alone for lice. It should be sprayed upon the cattle in a fine mist or it may be applied with a rag. Care should be taken not to use so much that the hair will come off.

Lice on hogs.—The most satisfactory method for keeping hogs free from lice is to build a wallowing vat about 14 inches deep and large enough for one or two or three hogs as desired. It should be built of concrete with sloping sides and be kept filled with water to the depth of 8 inches. The ground around the vat for a little distance should be covered with concrete to prevent the formation of a mudhole. The vat should also be built beneath a shed for protection from the hot sun and rain. At necessary intervals a gallon of crude petroleum should be poured over the surface of the water in the vat. In wallowing the hogs will get enough oil on them to kill all the lice and, in this way, will keep free from these pests without any worry or trouble.

NOXIOUS PLANT DISEASES.

Corn, cotton, tomatoes, and other farm crops are affected with certain diseases as distinct and hurtful as the diseases that attack our farm animals. Occasionally whole fields of cotton are destroyed by disease and the rusts on oats and wheat cause an immense amount of damage every year. There is hardly a patch of cotton that will not show here and there a diseased plant. These plants may be recognized by their pale yellow leaves, wilted appearance, or loss of leaves, or perhaps death. In nearly every cornfield some stalks may be found with blackened, "smutty" ears. Such stalks are diseased and will not pro-

duce perfect ears of corn and perhaps none at all. Pear trees are almost sure, sooner or later, to become affected with the disease known as *blight*. The leaves droop and turn black, then the branches shrivel and die. Finally the whole tree gives up trying to grow and dies. There is hardly a fruit tree when left to itself, that does not become affected with some disease.

Mold on bread and cheese.—If we were to place a piece of bread or cheese in a dish and keep them in a moist place where they would not dry out they would soon become covered with mold. The mold might be white, blue, or even yellow in color. If the mold is allowed to go on growing, the bread or cheese will decay and finally disappear entirely.

These white and blue molds are two different kinds of very simple, low plants that live upon such substances as bread, cheese, apples, dead leaves, wood, etc. The molds live upon the food material that they find in the bread, cheese, and apples and finally devour, as it were, the latter entirely. When the bread has been used up the mold will have no more food and it too will dry up and die.

Whenever apples, sweet potatoes, cabbage, or other vegetables begin to decay we may be almost sure that some mold is at work upon them. Botanists call these molds and many other similar, low plants that cause the sickness, decay, and often death of other plants, *fungi*. The singular of this name is *fungus*.

How a fungus begins.—Each one of the molds that we saw on the apples, bread, or cheese was made up of a great number of tiny, round threads hardly large enough to be seen with the unaided eye. Moreover, some of these threads, as the mold grows older, bear on their ends, very small round bodies known as *spores*. These spores serve as seeds for the mold because, when they are full grown, they may fall upon other pieces of moist bread and will then germinate, much like a seed, grow and produce the white threads that form another mold. This is the way then that molds or fungi begin. Moreover, these spores are small and light and are blown by the wind, or borne on the water, or are carried by insects from one place to another. In this way fungi are scattered all over an orchard or field of corn, cotton or oats.

Plant diseases are catching.—If an apple lying in a box becomes affected with a fungus the spores that are finally produced may fall upon another bruised apple lying close by. The juice of the bruised spot furnishes enough moisture so that the tiny spores germinate and produce a fungus upon the second apple that finally causes it to decay. If the plums on one tree in an orchard are affected with the fungus

that causes the brown rot of plums the spores from this tree will be blown to another tree. Here they will germinate and cause these plums to rot and so on through the whole orchard, perhaps. The same thing is true of corn smut, oat smut, etc. In other words, plant diseases are "catching" like measles, small pox and other diseases.

One way to prevent plant diseases.—It is evident that one way to prevent the growth of that fungus in the box of apples is to pick out the sick or decaying apples and destroy them. When this is done, no more spores will be produced to fall upon other apples and start the mold. Much the same thing is true of pear blight and a disease known as the black knot of plums. If we go at once to the pear trees and plum trees and cut out all the diseased limbs and burn them we can often stop or check the disease.

Again, the fungus causing the decay of the apples entered the fruit at a bruised spot or where the skin was broken. It could not enter a healthy, unbroken skin. This is often true of diseases of fruit trees. When a tree becomes bruised or the bark torn off, spores enter the wound and cause disease. So we can prevent some diseases by careful treatment of fruit and trees so that they will not be bruised and the skin or bark broken.

Spraying to prevent plant diseases.—There are certain diseases that will attack perfectly sound and healthy fruit and trees. These must be prevented by spraying the trees and fruit with some substance that will kill the spores and threads of the fungi. The substance most widely used for spraying plants to prevent disease is a mixture of quick lime, copper sulphate, and water known as *Bordeaux*.

Reasons for spraying.—Sometimes spraying is the only way to prevent the total loss of a crop of fruit. Again, spraying, if done properly and thoroughly, will prevent scabby, knotty, rough fruit. Any fruit grower who wishes to get good prices for his fruit must send smooth, perfect fruit to market. Such fruit, often obtained only by spraying, brings a higher price and gives the grower a reputation for producing a fine product. In the long run his income will be greatly increased.

Treating seed to prevent disease.—Oats are very often affected with a disease known as smut. The heads of the oats become black and are covered with a dry, smutty powder. The grains are usually entirely destroyed by this fungus. The smutty powder is nothing less than great numbers of the fungus spores massed together on the heads. These exist over winter sticking to the seed oats. If seeds

carrying spores are sown in the spring the spores will germinate and attack the young growing plants finally causing smut. If, on the other hand, the seeds are thoroughly sprinkled with a solution of formalin the spores will be killed and the smut prevented.

Selecting healthy plants and seed.—There is also another way to prevent disease from destroying farm crops. Cotton, for example, is subject to a disease known as wilt. In South Carolina, especially, the wilt disease often destroys whole fields of cotton. But where this disease is present in a field of cotton there are usually some individual plants that are not affected but that grow well and produce good, healthy seed. Evidently such plants are able, for some reason, to resist the wilt disease. Moreover, it has been found that if the seed from these healthy plants are gathered and planted the next season they produce plants that are not subject to the wilt. This teaches us that we may obtain strong, vigorous plants by planting seed that we have selected from healthy plants the year before. This same principle is true of other plants and very likely of all plants.

SUBSTANCES FOR PREVENTING PLANT DISEASES.

Standard Bordeaux Mixture.—This is the best general fungicide known and is made according to the following formula:

6 lbs. copper sulphate (bluestone),
4 lbs. quick lime,
50 gallons of water.

The copper sulphate is suspended in a sack in a barrel containing 25 gallons of water and allowed to remain over night, or until entirely dissolved. The lime is slaked with just enough water to make a thin paste. It is then poured into a barrel containing 25 gallons of water and thoroughly stirred. The two solutions of copper sulphate and lime are then poured together making 50 gallons of mixture which is ready to use at once. This solution is now used mostly to spray peach trees before they bloom to prevent peach leaf curl. It is also used on apple and pear trees and on grape vines before blooming.

General Bordeaux Mixture.—The standard Bordeaux is too strong with copper sulphate to be used with safety on most of our fruit trees when in leaf. It has, therefore, been modified for general use and the following formula is most universally used now for general spraying:

5 lbs. copper sulphate,
5 lbs. quick lime,
50 gallons of water.

It is made exactly as described for the standard Bordeaux mixture.

Peach Bordeaux.—Even the general Bordeaux is a little too strong for *peach* and *plum* trees. It is liable to injure the leaves. Therefore, for peaches and plums, the copper sulphate is lessened and the lime is increased as shown in the following formula:

3 lbs. of copper sulphate (bluestone),
6 lbs. quick lime,
50 gallons of water.

It is made as described for the standard Bordeaux.

Test for Bordeaux.—It sometimes happens that the copper sulphate and lime do not combine just as they should and the mixture becomes unsafe to use. When just right it will be a brilliant sky blue color. Sometimes, however, the mixture has a greenish caste which indicates that it is not right and is not safe to apply.

To be absolutely sure that the Bordeaux mixture is in proper condition get a small bottle of a 10 per cent. solution of *yellow prussiate of potash* from your druggist and pour a few drops into the solution of lime and copper sulphate. If the yellow drops turn reddish-brown the Bordeaux is not right and lime should be added until when the prussiate of potash strikes the solution it will retain its yellow color and not change to a reddish-brown.

Formalin for oat smut.—The spores causing oat smut adhere to the seed and are sown with them in the field. If the seed oats are treated with a solution of formalin before they are sown the disease can be very largely prevented. Formalin can be bought in a liquid form in a 40 per cent. solution under the name of Formaldehyde.

Treatment of seed.—Select a tight floor in a barn, granary, or house, sweep it clean and wait until the dust settles. Then put down a layer of seed oats, say one and one-half inches thick, make a dilute solution of formalin by putting 1 pint of the 40 per cent. solution in 45 gallons of water. With a hand sprinkling pot thoroughly sprinkle the layer of oats and shovel them over until every seed is moistened by the formalin. Put down another layer of oats, sprinkle and shovel over again. Perhaps 3 or 4 layers may be treated in this one pile but when the oats get deeper than 5 or 6 inches it will be best to remove them and begin a new pile. After a lot of oats is treated they should be covered with a sheet to keep off the dust and stirred occasionally to prevent heating and facilitate drying. When dry they are ready to be sown.

Formalin for potato scab.—Scab on Irish potatoes may be prevented by soaking the seed potatoes for two hours in a solution of formalin made by mixing 1 pint of the 40 per cent. formaldehyde with 30 gallons of water.

30 gallons of the solution is sufficient for 15 or 20 bushels of potatoes. If only a few bushels of potatoes are to be treated, a less amount of solution can be made by using lesser amounts of formaldehyde and water and preserving the same proportions.. After treating the potatoes they should not be put in infested sacks nor planted on ground that has borne scabby potatoes.

Pear blight and its treatment.—Pear trees are subject to one of the most fatal diseases affecting any plant. This disease is known as *fire blight*, *pear blight*, etc. It generally begins by attacking the ends of the branches, the leaves of which turn black, shrivel and die and the tree looks as though fire had scorched the ends of the twigs. If left undisturbed, the disease works along down the branches, attacking the larger ones and then the trunk until, finally, the whole tree becomes affected and succumbs.

The disease is due to a minute germ (*Bacillus*) that is carried from tree to tree by insects and probably other agencies. There is no known specific remedy for the blight but there are certain palliative remedies which will hold the disease in check, and if persistently practiced may stamp it out.

The first and main preventive is the removal of all blighted branches. This should be done in the late fall and winter because at this time the growth of the germ has stopped and its location in the branches can be more surely determined. In removing the diseased twigs, one should cut far enough below the dead portion to be perfectly sure that all the germs and affected wood are taken away. Before cutting off another twig, the cutting instruments should be dipped in a poison solution made by adding one teaspoonful of corrosive sublimate to two gallons of water. This solution should be made in a wooden bucket and carried about with the pruner. Every time a branch is cut off, the knife or shears should be immersed in the solution in order that any germs sticking to the instruments may be killed and not carried to another branch of the tree or to different trees. If this practice is persistently followed in an intelligent manner every winter the disease may be greatly checked if not stamped out. All of the removed branches should be completely burned.

Another precaution to be taken is to remove all water sprouts as close as possible to the tree trunk so that the wounds made in cutting them off may quickly and effectually heal over.

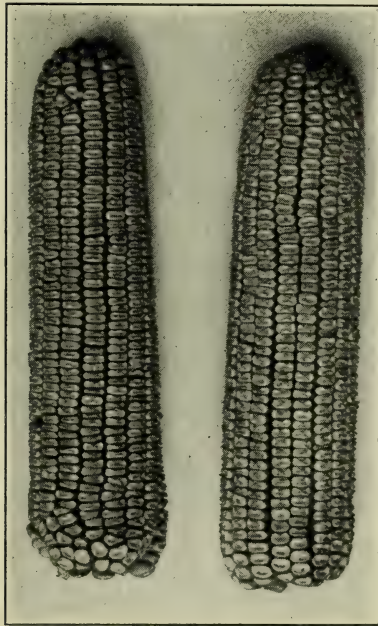
Lastly, the pear trees should be kept from making too great a growth. Trees that grow fast become tender, succulent, and sappy and afford a splendid place for the germs to increase and thrive. Trees that are well cultivated and heavily fertilized make too rapid a growth and blight worse. Therefore, we believe that pear trees should be left in the sod and not given too much cultivation or forced to grow fast.

Mississippi Agricultural Experiment Station.

BULLETIN No. 103

Farmers' Institute Bulletin, 1907

By W. R. PERKINS



Two Good Mosby Ears

AGRICULTURAL COLLEGE, MISSISSIPPI,

JULY 1907

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CORN IMPROVEMENT IN MISSISSIPPI.

Corn is the most important cereal grown in the United States. The annual production of this crop reaches the enormous amount of nearly three billion bushels.

The average yield for the whole country is something like 27 bushels per acre. Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska produce nearly two-thirds of the entire crop of the country. The average yield per acre in these seven corn states is about 38 bushels. In Mississippi, the average yield is twelve bushels per acre, which, of course, means that on fully half of the land planted to corn in the state the yield is less than this very low figure.

The cost of growing corn when only 12 bushels are produced per acre cannot be less than 75 cents per bushel if a fair price is allowed for rent, teams and other expenses, and living wages is given to the laborer. If the yield is no more than 7 or 8 bushels per acre, the cost for each bushel will be about one dollar.

Corn, is, perhaps, used more extensively in the South for feeding work animals and as human food than in any other country on the globe, and this being the case, the cost of its production becomes a very important question. Seventy-five cents to one dollar per bushel is entirely too high, as first cost for corn, and especially is this true when made on the wage basis of seventy-five cents per day. With but little additional effort intelligently directed, we believe that the yield of corn for this state can be raised to twenty or more bushels per acre; and it is with the hope of giving assistance along the line of the improvement of corn that this circular on corn growing contests, corn judging, and corn breeding is published. A more extensive bulletin covering all phases of the subject will be published later in the year.

Corn Growing Contests.—To reach all the citizens of a state in a matter of education requires time. One of the best plans that has been tried in the Corn Growing States for spreading information and creating interest in the subject of corn improvement has been the Corn Growing Contests among the school children and younger men of the communities. Such contests stimulate interest in the study of the subject, and give an incentive for intelligent effort in growing the crop and improving its quality.

Corn Shows.—An exhibit of corn should follow the field contests. Such an exhibit brings into visible competition the crops grown, and forces those who would win prizes from year to year into a close study of the corn in getting up their exhibits.

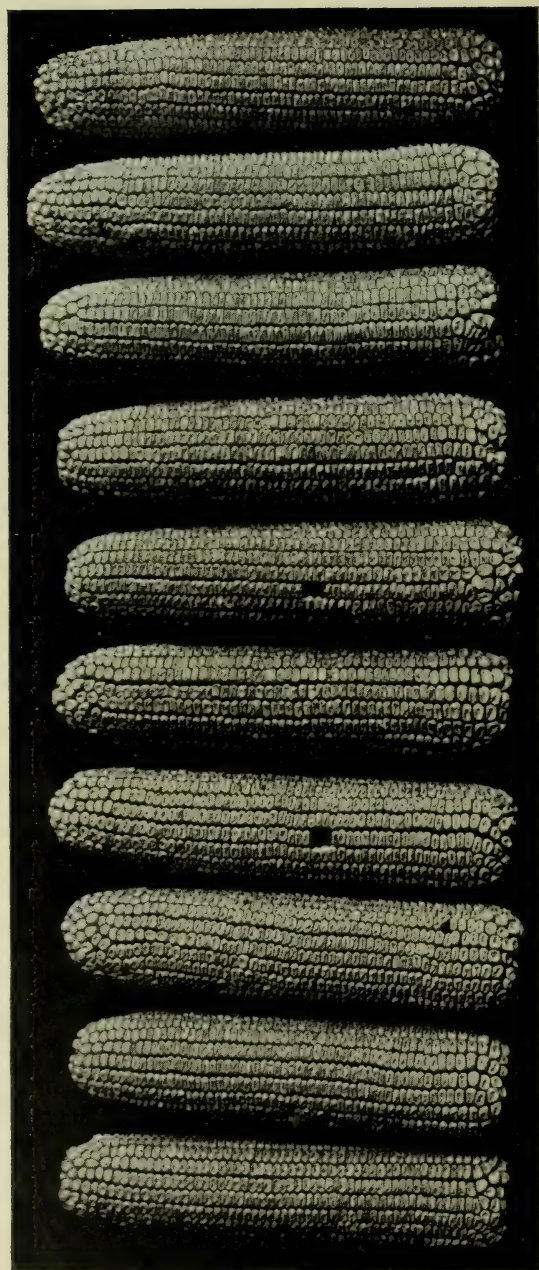


FIGURE 1.—A good sample for exhibition purposes or for planting, showing Uniformity in size of ears and in breed type.

From A. T. Wirncko, Purdue University.

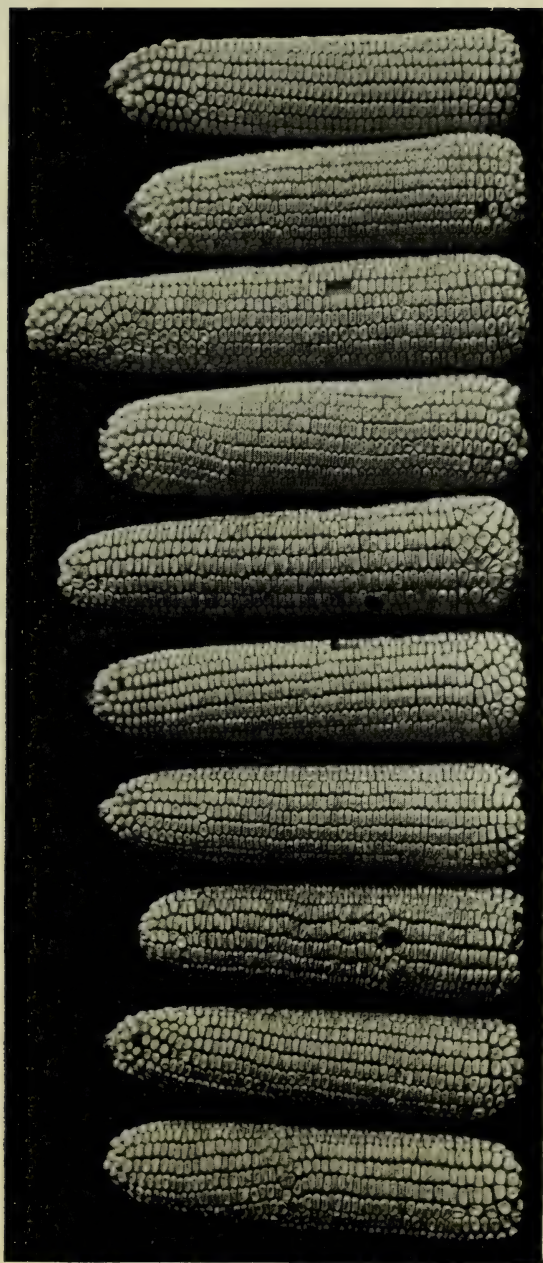


FIG. 2.—Ten ears not good enough to exhibit or to plant on account of lack of uniformity in type.

From A. T. Wiancko, Purdue University.

Uniformity of Exhibit.—This point is closely related to “Trueness to Type.” In addition to which, it shows the care and skill that has been put forth in getting up the exhibit. The ears should show uniformity in shape, size, and general appearance.

Trueness to Type.—In an exhibit of corn that is said to be a certain variety, all of the ears should be of the same type. This resemblance should be so striking that there would be no doubt about the matter. The ears to be true to the variety type are not necessarily to be the same size, but they should show resemblance in all other respects. See Figures 1 and 2.

Shape of Ear.—The cylindrical form admits of more corn on the cob and is consequently the best, though some splendid varieties of corn have tapering ears. The cylindrical ear is so, as a general rule, because the grains are longer toward the tip than is the corn with ears that taper.

Color of Kernels.—The purity of the corn as to variety is shown by the color. A white variety should be all white, without any yellow sided kernels; and a yellow variety should not show grains with white caps. Such discoloration shows a mixture and is objectionable because it has a tendency to produce too much variation. Where there is much variation, some of the off-spring will be poorer in quality than the parent, and unless care is taken in selecting seed from such corn and is kept up for a number of years, the variation increases and the productiveness falls off. This mixing or the resultant variation is the cause of the so-called “running out of seed” of which we so frequently hear. If an ear in an exhibit has one off-colored kernel, the exhibit should be cut in scoring one-tenth of a point. If scoring individual ears, it should be cut a full point, and more than four grains on an ear should cause it to be scored zero as to color or purity.

Color of Cob.—The same applies to the color of the cob. White corn should have all white cobs, unless it is a red cob variety, when they should all be red. Yellow corn usually has red cobs, and they should all be of nearly the same shade of redness.

Vitality or Soundness.—This is an important point. An ear of corn should be firm when given a twist with the hands, and the grains should be set in close in the rows. No rotten kernels are allowable. The grains should present a fresh and live appearance without any discoloration of the germ, or of shrivelled skin on the face of the grains.

The grains should not show too much white starch on their backs, but should have a smooth shiny appearance. The germ should be large, and there should be no evidence of chaffiness in the kernels.

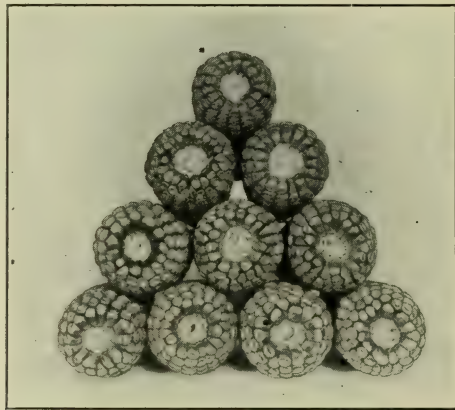


FIG. 3.—TEN GOOD BUTTS.

Butts.—The rows of kernels should extend straight out and over the butt and close up around the shank, presenting a well rounded form with a medium sized shank. The advantage of a well filled butt in an ear of corn is that it increases the amount of grain.

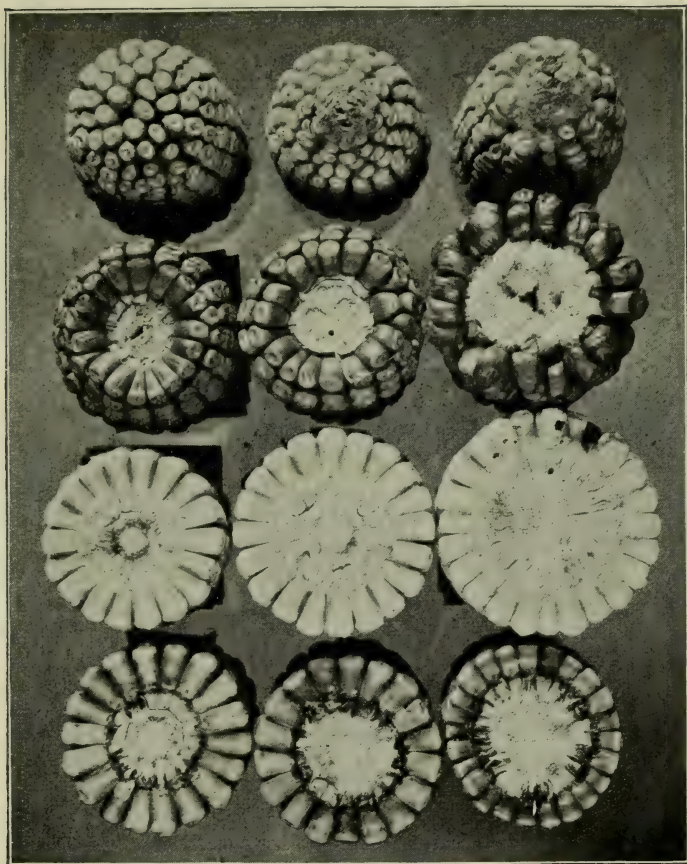


FIG. 4.—The tip on the left in the top row is ideal, the one in the middle is good and the one on the right is poor. The butt on left is too small, the one in the middle very good, the one on the right poor. The cobs on the left are small, those in the middle are good, those on the right are too large. (From Bul. Mo. Exp. Sta.)

Tips.—The rows of kernels should extend straight from butt to tip, continuing out over the end, covering the tip with kernels of good length. The perfect tip should be entirely covered with a tip grain on the extreme point. Owing to the frequency of the ear worm in Southern grown corn and to unfavorable conditions of soil and season, the tip is rarely well filled, and not so much importance is attached to it. It is always good policy, however, to get the best possible, as it shows a tendency to mature the full ear under given conditions. Such should be saved for seed with the view of having the quality transmitted to future generations.

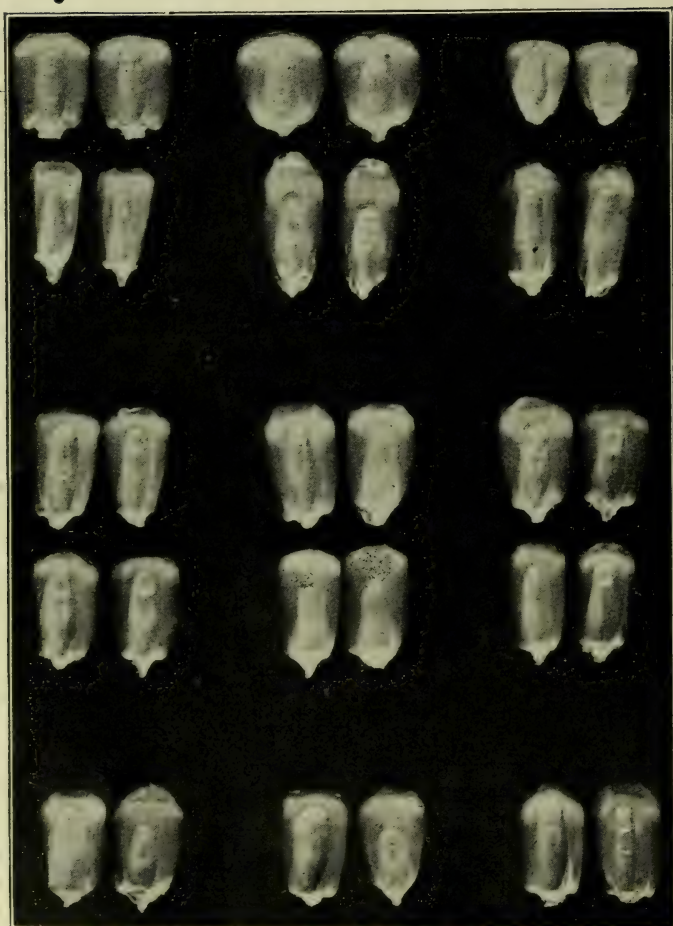


FIG. 5.—SHAPE OF KERNELS—The two upper rows show poor shapes of kernels; the two rows near middle, good shapes; and those in lower row, different sizes of germ. (From Bul. Mo. Exp. Sta.)

Kernels—*shape and length.*—The kernels should be so shaped as to fit in closely with each other from the cob out to the circumference of the ear, leaving little unoccupied space. They should be deep with the view of getting more corn around the cob. Very small cobs are objectionable because the kernels, if of good size, will be too sharp pointed. Small germs are usually associated with sharp pointed kernels. On the other hand, a very large cob is objectionable because of the tendency to very short kernels on such cobs, and the liability of the grain to mould. No mention is made of the cob in the score card as it is of little consideration, further than has been mentioned, and the question of more corn is dependent more on the length of kernel than on the size of cob. A medium size cob is preferable.

Kernels—*uniformity*.—The kernels should be of about the same length, width, and thickness on the different parts of an ear and on different ears. This shows a purity of type, but more important, it can be put down with a planter much more uniformly. This is especially desirable when no thinning of corn is done by hoe hands, the thickness of corn being decided on before planting and the planter set to put down the right number of kernels.

Length of Ear.—This may vary with different varieties of corn, and a standard for each kind should be adopted. The length and circumference of an ear should be in the proportion of 4: 3; or an ear 8 inches long should be 6 inches in circumference, one 10 inches long $7\frac{1}{2}$ inches in circumference.

Circumference of Ears.—The relation 3: 4 between circumference and length should be the standard. The circumference is measured around the ear one-third of the distance from butt toward tip.

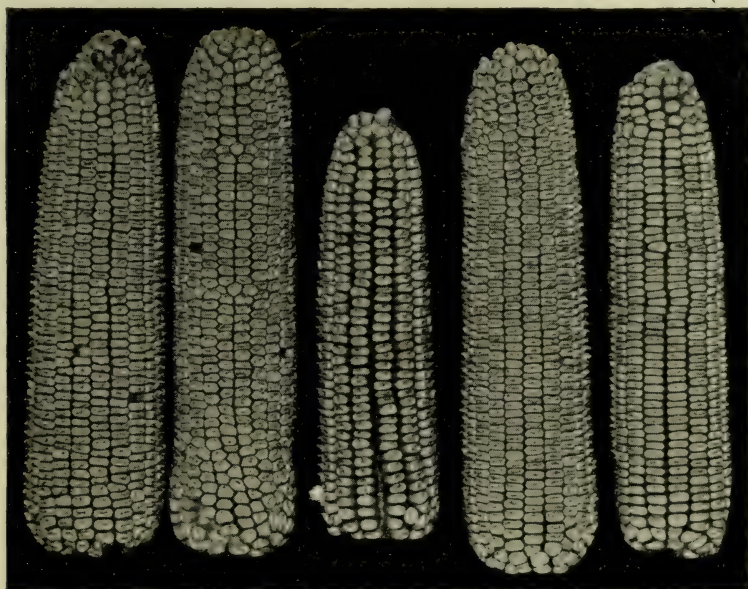


FIG. 6.—SHOWING SPACE BETWEEN ROWS. The 1st and 4th from left are about right, No. 2 is too close and No. 3, too open. (From A. T. Wiancko, Purdue University.)

Furrows between Rows.—The furrows between rows should be narrow, not over one thirty-second of an inch. The ideal in the perfect ear being the one that has the most possible corn on an ear of a given size.

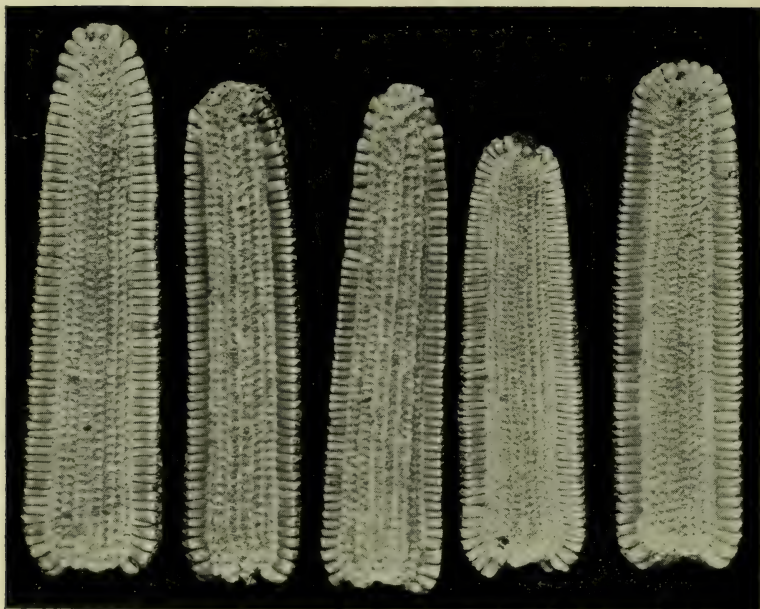


FIG. 7.—SPACE BETWEEN KERNELS AT COB. Nos. 1 and 4 from left have too much space between kernels. (From A. T. Wiancko, Purdue University.)

Space between Kernels at Cob.—Remove two or three adjacent kernels from a row and examine the kernels at the cob in the adjoining rows. They should fit close together with no space between them. Very much space at this point indicates immaturity or chaffiness in the corn, and ears having this defect will usually be found limber when given a slight twist. The kernels will also be found to be thin and pointed at the tip, with small germs.

Proportion of Grain.—This refers to the proportion of grain to the weight of the ear with shuck removed. Experience in judging corn will enable one to estimate this very accurately. The cylindrical form of ear with long kernels throughout, well filled butts and tips, and very little space between rows or between kernels at cob will indicate a high percentage of corn. A good ear of corn should show about 88 per cent. of grain.

To become familiar with the determination of this point, after judging a few samples of ten ears, take every other ear as they lie on table and weigh and shell them. Compute the percentage of corn as follows: Weigh the five cobs, and subtract this weight from the total weight of the five ears, which will give the weight of shelled corn; divide the weight of shelled corn by the total weight, which gives the per cent. of shelled corn.

$$\frac{(\text{Total weight} - \text{weight of cobs})}{\text{Total Weight}} = \text{Per Cent.}$$

Practice is essential to becoming an expert corn judge, as the scoring of samples is more a relative matter than absolute. The total score of a sample by a beginner will not always indicate the proper placing of ears or samples. One must become perfectly familiar with the points and be able to weigh them relatively in his mind, and use judgment in coming to a decision.

If judging an exhibit of ten ears, each should be considered as constituting one-tenth of the whole. The scoring with reference to the different points, the butts for instance, can be more readily done by examining each and making a note of how many tenths of a point should be deducted for each ear, adding all together when completed and deducting from five, the points allowed for butts. If the cut made on the different ears of an exhibit should be as follows: .1, .1, .2, .3, .1, .2, .2, .0, .3, and .1, the sum of the tenths would be 1.6, then $5 - 1.6 = 3.4$, the score to be given the sample on butts. Other points should be considered in the same manner. Two judges would not necessarily give the same scoring on a sample, but they should reach the same conclusion as to the relative placing of the samples or ears.

Seed Corn.

There has been so much written and said on the subject of improved seed during the past few years that some may have been led into the belief that "pedigreed seed" would solve the question of our low yield of corn. Good seed will improve the yield of corn, but can in no way relieve the necessity of paying attention to the fertility of the soil, the preparation of the land, the cultivation of the crop and to the various other points that have an influence on yields. It is but one of these several points and like the others will pay well in return for intelligent effort expended in making improvements.

Good seed corn means seed that will produce maximum crops under the conditions which govern its growth. The breeding patch in which to grow and improve the corn and the selection and testing of the seed is the means by which improvement may be made.

Breeding Patch.—Corn has been improved by the breeding patch more than by any other means yet known. The plan followed by most corn breeders is simple, and may be carried out by any one who is willing to devote a small amount of time and labor to it.

The two main reasons for the breeding patch as it is conducted are:

First.—That of two or more ears of corn, one apparently as good as another, one of them may have the capacity of producing forty bushels, another fifty, and still another only twenty-five bushels per acre. Such differences do exist as shown by our work here and in

dozens of experiments conducted in the corn belt. Such being the case, it will undoubtedly be better to save seed from the ears that produce the most corn, and discard the seed from ears of low yielding capacity.

Second.—Corn is in its nature a cross-fertilized plant. Experiments made by fertilizing the silks with pollen from the tassel grown on same stalk have shown that three generations of such in-breeding have reduced the yielding power of the corn more than one-half.

The breeding patch aims to prevent any in-breeding and at the same time to show us the ear that will produce the most corn. It is conducted as follows:

First.—Select forty or fifty of the best ears of the best variety of corn that can be found. Number the ears 1, 2, 3, etc.

Second.—Select a piece of good corn land, of sufficient area to have one row for each ear. The land should be well removed from corn of any other variety, fully a quarter of a mile. Prepare the land as for an ordinary crop of corn.

Third.—Plant ears Numbers 1, 2, 3, etc., on rows of the same number, and give the same cultivation and fertilization as ordinarily given to corn. When the tassels begin to appear and before they are well out, go through the field and pull out the tassels from every stalk on rows Number 2, 4, 6, 8, etc., all of the even numbers.

When the corn is ready to gather, husk the even numbered or de-tasseled rows, and weigh the corn from each separately. This will show you which has produced the most corn, and the tassels having been removed from them, there will have been no in-breeding. Save the select ears from the high yielding de-tasseled rows for a breeding patch the next year, and the ears that are good enough for seed use in planting the whole crop.

It might happen that some of the best yielding rows are among those that were not de-tasseled. In order that you may have an opportunity to save seed from any one of the fifty rows, it is a good plan to plant half of the length of rows in the order described above. Then, beginning on the opposite side of the patch with Numbers 1, 2, etc., plant the other end, de-tasselling the odd numbers 1, 3, 5, 7, etc., in this case. After developing a variety that produces well, we may still make it yield a little more, from year to year, by paying attention to the points of merit in an ear—selecting, for the breeding patch, ears of the proper shape to hold more corn; getting a few more grains on the butts and tips of each; lengthening the grains; giving them a shape that will allow more of them to wedge in around the cob; and finally of making the ear of proper length and circumference and as compact and solid as possible. The points constitute the corn score card, which is of great assistance as a guide in studying corn.

Testing Seed Corn.

A good stand is important, and this cannot be had unless the corn will come up and grow. It would surprise most people to select one hundred ears of corn and test each one separately to see how many have kernels on them that will not germinate or that come up very slowly and very weak.

A good strong germinating seed means a good strong plant when young and throughout its growth. Testing each ear will enable one to locate every ear that will not come up, as well as those that are very slow in germinating or that will produce weak young plants. It is pretty generally recognized that if two grains of corn are planted in a hill and one of them comes up in less than a week and the other is two weeks in getting out of the ground, and comes up sickly in appearance, the difference will continue in a greater or less degree through the life of the two plants, and will still be manifest in the good ear that comes from one and the nubbin that is gathered from the other at harvest time.

Test Every Ear.—It will pay every farmer who is striving to produce more corn to test every separate ear before shelling. This is not a very big job. One man or woman by working ten or twelve hours can easily test enough corn to plant twenty-five acres, which would mean only about four cents as the actual cost in labor per acre.

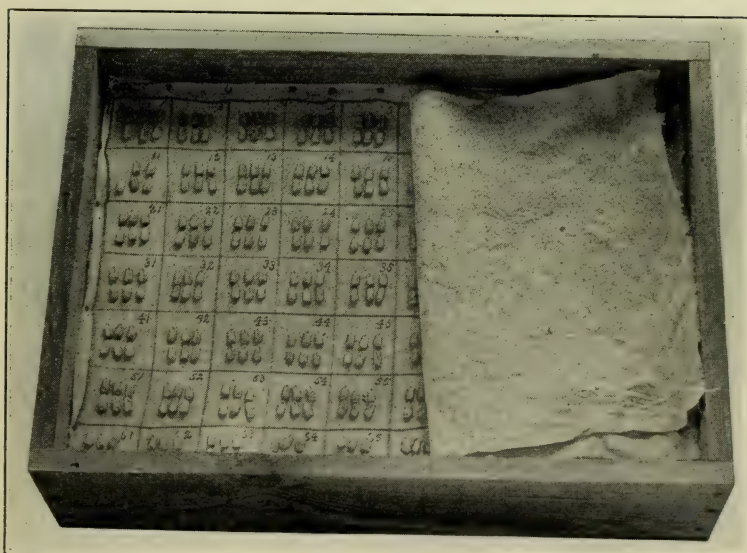


FIG. 8.—GERMINATION BOX.

Germination Box.—A plain box twenty-four inches square and six inches deep is a very convenient size for testing one hundred ears at a time. The box is filled half full of wet saw dust smoothed and packed down into the box. A piece of domestic is then ruled off in heavy lines with a pencil into squares of two inches each—ten rows with ten squares on each—requiring twenty inches by twenty inches. This domestic is then tacked down close on top of the saw dust, putting tacks along the sides and in the corners. Commencing at the upper left hand corner, these squares are numbered, the first row from one to ten, the second from eleven to twenty, and so on.

The box is now ready for the corn. The one hundred ears of corn are laid out in a row on the floor or on a table where they can remain till the test is over. A nail may be driven at each end of the row to hold the corn in place.

Take six grains from each ear, two near the butt, two from the middle of ear, and two from near tip, taking all of the grains from different rows, and lay at the end of ear from which they were taken. When the grains are all ready, commence with ear number 1 and place the six grains in square number 1, ear number 2 in square number 2, and so on with all the tips pointing one way.

Then, take another piece of light domestic about twenty-two inches square, wet it, and spread flat down on top of the grains in germination box. After this, another large cloth or sack containing about a peck of wet saw dust is placed on top, and packed down close around the edges and into the corners of the box. In six or seven days, depending on the temperature, the grains will have sprouted. When the sprouts have reached the length of one and one-half inches, the box is ready to be examined and finally passed upon. Any ear with one or more of the six grains not sprouting should be indicated by turning the ear end for end or of slipping it out an inch or two, so as to be able to locate it. After indicating the unsatisfactory ears, they should all be removed. The good corn is then ready to shell. Unless good seed ears are scarce, none should be saved to plant that do not show by the test their ability to grow quick and strong.

Mississippi Agricultural Experiment Station.

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BULLETIN NO. 104.

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INSPECTION AND ANALYSES
OF COTTON-SEED MEAL
ON SALE IN MISSISSIPPI



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI,  
AUGUST, 1907.

# MISSISSIPPI FERTILIZER CONTROL.



## INSPECTION AND ANALYSES OF FERTILIZERS

By the Chemical Department of the

Mississippi Agricultural and Mechanical College.



|                       |                   |
|-----------------------|-------------------|
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# INSPECTION AND ANALYSES

## OF COTTON-SEED MEAL.

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MISSISSIPPI AGRICULTURAL AND MECHANICAL COLLEGE,  
DEPARTMENT OF CHEMISTRY.

August, 1907.

**Introduction.**—While cotton-seed meal is one of the most important of the concentrated feeding stuffs obtainable, and has long occupied a position of prominence among commercial fertilizer materials, there are still many farmers and feeders who do not clearly understand the relation of the composition of meal to its actual value as a fertilizer, or as a feeding stuff. A general inquiry into the conditions surrounding the sale and use of this common commodity in the state emphasizes the desirability of a wide dissemination of information concerning the important constituents of meal and the value of these as a source of food for both plants and animals. An elementary discussion of these subjects which have so often received attention in experiment station publications and in agricultural journals may serve a useful purpose in connection with the chemical analyses contained in this bulletin. These analyses have been made in accordance with the recent law providing for the analysis and inspection of cotton-seed meal.

**Cotton-seed meal as a fertilizer.**—The valuable substances contained in fertilizers are: Nitrogen, Phosphoric Acid, and Potash, and when meal is used directly, the real value of it will be measured by the amounts of these bodies which the ton of meal contains. If it is fed to cattle and the manure applied, it is plain that the composition of the manure resulting from it will depend upon the quality of the material fed.

Fertilizer manufacturers pay so much a pound for the nitrogen, phosphoric acid, and potash contained in the raw materials from which they make up their mixtures, and, if the average retail price of each of these substances is known, the relative values of different fertilizers, composed of materials of equal availability, can be readily computed.

While cotton-seed meal contains available potash and phosphoric acid in addition to Nitrogen, the latter is by far the most valuable constituent. Since hulls contain very little nitrogen and phosphoric acid and only about half as much potash as meal, and, since low grade meal results from the admixture of hulls, the percentage of nitrogen



may be used as a basis for comparing the approximate relative values of meals carrying different percentages of this element.

At the beginning of the present fertilizer season, nitrogen in fertilizers cost the farmer approximately 20 cents a pound, and this price will be used in calculating the relative values of fertilizers for the season of 1906-1907.

The law requires that all cottonseed-meal be guaranteed, branded, and sold under the following classifications:

- (1) High Grade Cotton-Seed Meal which must contain at least 6.18 per cent. of nitrogen.
- (2) Standard Grade Cotton-Seed Meal which must contain at least 4.95 per cent. of nitrogen.
- (3) Off Grade Cotton-Seed Meal which contains less than 4.95 per cent. of nitrogen.

Assuming the off grade meals on our markets to carry an average of 3.50 per cent. of nitrogen the value of the nitrogen in meals classified as given above will be as follows:

|                               | HIGH GRADE | ST'D. GRADE | OFF GRADE |
|-------------------------------|------------|-------------|-----------|
|                               | MEAL.      | MEAL.       | MEAL.     |
| Percentage of Nitrogen .....  | 6.18       | 4.95        | 3.50      |
| Pounds of Nitrogen in 1 ton . | 123.60     | 99.00       | 70.00     |
| Value at 20c per lb. ....     | \$24.72    | \$19.80     | \$14.00   |

In view of what has been said in regard to value of meal when used as a **fertilizer**, the above computations bring out clearly the approximate relative values of the different grades of meal containing nitrogen as given under each classification.

**Th Manufacturer's Guarantee.**—The law establishes minimum percentages of nitrogen to be contained in the grades of meal on the market, and the mills must be careful to sell no meal under this. The purchaser may feel very well assured, therefore, that he will obtain a product equal or better than that guaranteed to him, since the manufacturer must allow a reasonable margin for differences in the quality of seed as well as for possible variations in the process of manufacture. The table of analyses will show that some high grade meals (guaranteed to carry 6.18% of nitrogen) contain over 7.00% of this element.

**Cotton-Seed meal as a feeding stuff.**—The high percentages of fat and protein make meal one of the most important of the concentrated feeding stuffs now obtainable. Cake and meal taken by foreign feeders is bought on the basis of content of these substances. A good grade of meal will contain about 8 or 9 per cent of fat or oil and about 42 per cent of protein.

The term protein includes a number of nitrogenous bodies which enter into the composition of ordinary foods. These substances are rich in nitrogen, and they are employed by the animal body for building muscular and other body tissue, as well as for supplying heat and energy. As nitrogen is the most expensive element of the forms of plant food, it is likewise the most valuable constituent of all animal foods. **Meal carrying a low percentage of nitrogen is no more satisfactory as a fertilizer than as a feeding stuff.**

The amount of **Protein** in a feeding stuff is ascertained by multiplying the nitrogen by 6.25. For example, a high grade meal analyzing 6.70% of nitrogen contains  $(6.70 \times 6.25)$  41.87% of protein. **These protein bodies are the most expensive constituents of any food,** and it is to them most largely that cotton-seed meal owes its distinctive value as a feeding stuff. A low grade meal contains a small percentage of nitrogen, and, consequently, a small percentage of protein. Here again, then, we find (as in the case of the use of meal directly as a fertilizer) that nitrogen is the most important of its ingredients, and it is the nitrogen for which the farmer and the feeder pay most largely when they buy a ton of meal.

**The relation between Nitrogen, Ammonia and Protein.**—While the law requires a guaranteed percentage of nitrogen only, the amount of ammonia, or of protein is often used in commercial transactions. The following factors may be found useful in making calculations:

Nitrogen  $\times 1.215$  = Ammonia.

Nitrogen  $\times 6.250$  = Protein.

Ammonia  $\times .8227$  = Nitrogen.

Ammonia  $\times 5.142$  = Protein.

Protein  $\times .1600$  = Nitrogen.

Protein  $\times .1944$  = Ammonia.

**The need of Cotton-Seed Meal Inspection.**—The variation in the quality of meal which has appeared on the markets is sufficiently well known. In practically all states where its sale reaches considerable proportions, appropriate legislation has been secured for the full protection of the trade. Mississippi was one of the last states to adopt regulations designed to place in the hands of farmers, dealers, and the mill owners, accurate information concerning the quality of all meal sold in the state.

The value of cotton-seed meal and other fertilizer materials and feeding stuff cannot be ascertained accurately by a mere examinations on the part of the purchaser. The system of fertilizer inspection which has been maintained for a number of years, enables the farmer to feel

secure in the purchase of his supply from year to year, and insures the manufacturer protection against a possible imposition by unscrupulous dealers. The ease with which meal can be admixed with hulls and the impossibility of detecting this in moderate extent renders careful inspection as necessary as in the case of commercial fertilizers. This protection will probably come to be welcomed by the mills no less than by the general public. The operation of the present law will have the effect ultimately of placing the meal trade upon a proper business basis, and farmers, dealers, and manufacturers generally will have an opportunity of finding out the composition of all meal manufactured or sold in the state.

**Method of Inspection.**—Before any brand of fertilizer or cotton-seed meal can be sold in this state, the manufacturer must file in the office of the State Chemist a guaranteed analysis. This guaranty establishes minimum percentages of the valuable constituents of the fertilizer or meal, and the product marketed under that brand name must be equal in quality to that shown in the guaranty. The guaranteed analysis must be printed also on the bag or on a tag to be attached to the bag, that any purchaser may know at once the quality of the material which he buys.

The Department sends inspectors to all parts of the state, and these men collect a large number of samples from goods in the hands of dealers. The samples are sent to the State Laboratory for chemical analysis, and, as soon as an analysis of a sample is completed, a copy is sent to the original owner, a duplicate going forward at the same time to the oil mill or fertilizer factory manufacturing the goods. In this way, the factories and the dealers or farmers are enabled to receive prompt information in regard to the products which they handle, and possible errors may be corrected at once.

The analyses are published from time to time throughout the season in bulletins and circulars, which are widely distributed among the farmers of the State. It is the object of the Department to maintain an effective system of inspection with no inconvenience to the general trade in fertilizers and meal.

**Table of analyses.**—Analyses of samples of meal drawn by regular inspectors are published for the first time since the law became effective. The table includes all analyses of inspectors' samples which have been made up to the time of going to press.

Inasmuch as the nitrogen in meal is often expressed as ammonia, and, as many are doubtless more familiar with this term, the ammonia equivalents of the nitrogen determinations are given in this bulletin.



The nitrogen guaranteed by each manufacturer is inserted in the table, that a ready comparison may be made with the analyses of the samples drawn by inspectors.

**Valuations.**—The valuations given here are based on nitrogen only. When these are considered in connection with what has been said in regard to the use of meal, the figures will give a very good idea of the relative values of the various meals represented by the samples analyzed. If an analysis shows a sample to contain 6.50 per cent. (6.5 lb. in 100 lbs. meal) of nitrogen, a ton of the meal will contain 130 lbs. ( $6.50 \times 20$ ). At 20c a pound, 130 pounds of nitrogen will be worth \$26.00. If another sample shows 7.00 per cent. of nitrogen on analysis, a ton will contain 140 lbs. worth \$28.00 at 20c a pound. These valuations are inserted merely to assist those purchasers who do not properly understand the relation of an analysis to the actual value of the meal.

**General results of the inspection.**—The table contains 242 analyses with 23 samples (9.5 per cent.) showing a lower percentage of nitrogen than that guaranteed by the manufacturer. It should be pointed out that these discrepancies are usually slight. While a few samples are too far below the guarantee, only four samples are as much or more than 5% below.

The results show, therefore, that farmers have very generally received meal practically as good or better in quality than that indicated by the guaranteed analysis attached to each bag of meal sold in the state. The quality of the meal manufactured by some mills is very much better than they have guaranteed it. This is the first season of the operation of the law, and, as the inspection and publication of analyses progresses, purchasers and mill owners will become more familiar with the composition and value of meal for feeding and for use as a component of fertilizer.

**The direct use of cotton-seed and of cotton-seed meal as fertilizers.**—Those farmers who make a practice of using at least a portion of their seed directly as a fertilizer would do well to investigate the conditions to determine if this procedure is advisable in view of the cash price which the mills offer. While some farmers contend that the oil in seed is worth something as a fertilizer, this idea has no real foundation in fact, and it should be quite generally admitted that **the direct application of seed to the soil involves an absolute waste of all of the oil which they contain.** In view of available statistics, it is safe to conclude that more than one-third of all the seed produced is reserved for planting, feeding, or for fertilizer purposes. It cannot be demonstrated that the market price for cotton-seed will allow its economical use under crops.

The relative values of seed and meal for fertilizer purposes should be understood by all farmers, that they may have no difficulty in determining if it will pay them to sell their seed and buy meal for use as a fertilizer, or even to purchase commercial fertilizers at once.

Admitting the availability of the fertilizer constituents of seed and meal, the comparative value of these in a ton of each may be ascertained from their average composition as shown below. We are dealing here, of course, with meal of good quality. The prices of nitrogen and potash used in this computation are those now employed for calculating the relative values of fertilizers. The phosphoric acid is estimated at 5c per pound:

(1) **Fertilizer constituents and value of cotton-seed.**

|                       |                                 |              |
|-----------------------|---------------------------------|--------------|
| Nitrogen .....        | 3.13% @ 20c lb. =               | \$12.52 ton. |
| Phosphoric Acid ..... | 1.27% @ 5c lb. =                | 1.27 ton.    |
| Potash .....          | 1.17% @ 5 $\frac{3}{4}$ c lb. = | 1.34 ton.    |

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|             |             |              |
|-------------|-------------|--------------|
| Total ..... | 5.57% ..... | \$15.03 ton. |
|-------------|-------------|--------------|

(2) **Fertilizer constituents and value in cotton-seed meal.**

|                       |                                 |              |
|-----------------------|---------------------------------|--------------|
| Nitrogen .....        | 6.79% @ 20c lb. =               | \$27.16 ton. |
| Phosphoric Acid ..... | 2.88% @ 5c lb. =                | 2.88 ton.    |
| Potash .....          | 1.77% @ 5 $\frac{3}{4}$ c lb. = | 2.03 ton.    |

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|             |              |              |
|-------------|--------------|--------------|
| Total ..... | 11.44% ..... | \$32.07 ton. |
|-------------|--------------|--------------|

With seed at \$15.00 and meal at \$25.00 a ton, one ton of seed will buy 1,200 pounds of meal, but the fertilizer constituents in

|                                 |         |
|---------------------------------|---------|
| 1,200 lbs. meal are worth ..... | \$19.24 |
| and in 2,000 lbs. seed .....    | 15.03   |

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Leaving a difference of.....\$ 4.21

per ton of seed in favor of the exchange of seed for meal on the above basis and at the present approximate retail price of nitrogen, phosphoric acid and potash. This example is sufficient to illustrate the method of reaching a close approximation of the relative fertilizer values of meal and seed, considered from the standpoint of the values of the fertilizer materials carried by a ton of each.

If the analyses already given are used as a basis, we find that 2,000 pounds of seed contain the **fertilizer equivalent** of 937 pounds of meal, though, as stated above, 2,000 pounds of seed may be exchanged now for at least 1,200 pounds of meal.

A number of field trials have been made which show that, pound for pound, the fertilizer constituents of meal are worth as much for the production of cotton as those of the whole seed.

Redding at the Georgia Station (Bul. 70, pp. 85-87) made some experiments in 1905 which showed for that year that 865 pounds of meal properly "balanced" and applied directly is the effective fertilizer equivalent of 2,000 pounds of crushed seed. Experiments previously made by him also showed that the fertilizer materials of meal and hulls applied together were equal to those of the whole seed for producing corn. Duggar (Ala. Sta., Bul. 78) concluded from his experiments that seed and meal are equally effective when quantities supplying equal amounts of nitrogen are used.

More recent experiments by Boykin (Farmers Bul. 286, U. S. Dep. Agr.) on land similar to a large percentage of cotton soils needing fertilizers, indicated that 900 pounds of meal are at least equal to 2,000 pounds of seed.

Probably other experiments could be cited to show that it is unwise to use seed as a fertilizer, when a price approaching the present market value can be obtained. If about 900 pounds of average meal are equivalent to a ton of seed which may be exchanged for at least 1,200 pounds of meal, the direct use of the seed not only results in the waste of, say, 37 gallons of oil but involves the loss of an equivalent of 300 pounds of meal per ton of seed used. Meal should be rarely used alone as a fertilizer, it being necessary to "balance" it by mixing with acid phosphate and potash salts also where a complete fertilizer is desired.

**Indirect use of cotton-seed and of cotton-seed meal.**—If it is wasteful to apply the seed instead of selling it and investing the proceeds in meal or in commercial fertilizers, it is still more so to use meal, as such, under crops, for cotton-seed meal is distinctively a concentrated feeding stuff.

Experiments at the Mississippi Station (Bul. 60) show that for dairy cows **one** pound of cotton-seed meal is equivalent in feeding value to **two** pounds of corn and cob meal, and to 1.71 pounds of whole cotton-seed.

One pound of cotton-seed was found to be equivalent to 1.17 pounds of corn and cob meal.

For beef production, one pound of cotton-seed meal equalled 1.92 pounds corn and cob meal and 1.60 pounds of cotton-seed, while one pound of cotton-seed was found to equal in feeding value 1.22 pounds of corn and cob meal.

The above results illustrate the value of meal and seed for feeding, but it should not be forgotten that the excrement (dung and urine) from feeds contains from 80 to 88 per cent. of the fertilizer value of the original feeds. Admitting even that only 50% of the fertilizer value of the food is recovered for the farm, the manure from a ton of cotton-seed meal is worth (present schedule of prices) at least \$16.00, and that from a ton of cotton-seed \$7.50.



| Laboratory Number. | Name of Brand and Manufacturer.                                                | Where and from Whom Collected.          |
|--------------------|--------------------------------------------------------------------------------|-----------------------------------------|
|                    | ABERDEEN OIL & ICE CO.,<br>Aberdeen, Miss.                                     |                                         |
| 6789               | H. G. Cottonseed Meal.....                                                     | N. T. Wax, Amory.....                   |
| 6790               | H. G. Cottonseed Meal.....                                                     | Aberdeen Oil & Ice Co., Aberdeen.....   |
| 6791               | H. G. Cottonseed Meal.....                                                     | Aberdeen Oil & Ice Co., Aberdeen.....   |
|                    | BUTLER-KYSER OIL & FERT.<br>COMPANY,<br>Fayette, Miss.                         |                                         |
| 6792               | H. G. Cottonseed Meal.....                                                     | Butler-Kyser Oil & Fert. Co., Fayette   |
|                    | F. W. BRODE & COMPANY,<br>Memphis, Tenn.                                       |                                         |
| 6793               | H. G. Cottonseed Meal.....                                                     | Foote Patrick Co., Laurel.....          |
|                    | BARBER & LEWIS OIL CO.,<br>Edwards, Miss.                                      |                                         |
| 6794               | H. G. Cottonseed Meal.....                                                     | W. M. Conner, Hattiesburg.....          |
| 6795               | H. G. Cottonseed Meal.....                                                     | The Lampton Co., Columbia.....          |
|                    | BROOKHAVEN PROGRESSIVE<br>COTTON OIL COMPANY,<br>Brookhaven, Miss.             |                                         |
| 6796               | H. G. Cottonseed Meal.....                                                     | A. C. Seavey & Sons, Brookhaven....     |
| 6797               | H. G. Cottonseed Meal.....                                                     | J. D. Smith & Co., Prentiss.....        |
| 6798               | H. G. Cottonseed Meal.....                                                     | J. D. Smith & Co., Prentiss.....        |
|                    | BUCKEYE COTTON OIL CO.,<br>Greenwood, Miss.                                    |                                         |
| 6799               | H. G. Cottonseed Meal.....                                                     | A. M. Stoner, Greenwood.....            |
| 6800               | H. G. Cottonseed Meal.....                                                     | A. M. Stoner, Greenwood.....            |
|                    | BUCKEYE COTTON OIL CO.,<br>Jackson, Miss.                                      |                                         |
| 6801               | H. G. Cottonseed Meal.....                                                     | J. E. McNair, Lumberton.....            |
| 6802               | H. G. Cottonseed Meal.....                                                     | J. P. Meyer Merc. Co., Taylorsville.... |
| 6803               | H. G. Cottonseed Meal.....                                                     | Ainesworth, Mayfield Co., Taylorsville  |
| 6804               | H. G. Cottonseed Meal.....                                                     | Gulfport Grocery Co., Gulfport.....     |
| 6805               | H. G. Cottonseed Meal.....                                                     | J. R. Hood, Gulfport.....               |
| 6806               | H. G. Cottonseed Meal.....                                                     | Holloway & McRaney, Collins.....        |
| 6807               | H. G. Cottonseed Meal.....                                                     | Osyka Merc. Co., Osyka.....             |
| 6808               | H. G. Cottonseed Meal.....                                                     | Fernwood Lumber Co., Fernwood.....      |
| 6809               | H. G. Cottonseed Meal.....                                                     | Holloway & McRaney, Collins.....        |
| 6810               | H. G. Cottonseed Meal.....                                                     | Williamsburg Lumber Co., Collins.....   |
|                    | CLAY COUNTY COTTON OIL CO.<br>West Point, Miss.                                |                                         |
| 6811               | H. G. Cottonseed Meal.....                                                     | J. A. McLeod & Co., Hattiesburg.....    |
| 6812               | H. G. Cottonseed Meal.....                                                     | Clay County Cotton Oil Co., West Point  |
| 6813               | H. G. Cottonseed Meal.....                                                     | E. F. Nunn & Company, Shuqualak....     |
| 6814               | H. G. Cottonseed Meal.....                                                     | Clay County Cotton Oil Co., West Point  |
|                    | CRYSTAL SPRINGS OIL MILL,<br>FERT. & M'F'G. COMPANY,<br>Crystal Springs, Miss. |                                         |
| 6815               | H. G. Cottonseed Meal.....                                                     | Lotterhos & Huber, Crystal Springs....  |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6789               | 7.26               | 7.13               | 8.66                                          | 6.18                 | 7.50                                               | 28.52                         | 24.72                                       |
| 6790               | 7.62               | 7.15               | 8.68                                          | 6.18                 | 7.50                                               | 28.60                         | 24.72                                       |
| 6791               | 7.92               | 7.16               | 8.69                                          | 6.18                 | 7.50                                               | 28.64                         | 24.72                                       |
| 6792               | 10.21              | 6.07               | 7.37                                          | 6.18                 | 7.50                                               | 24.28                         | 24.72                                       |
| 6793               | 7.04               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 6794               | 10.62              | 5.72               | 6.94                                          | 4.95                 | 6.01                                               | 22.88                         | 19.80                                       |
| 6795               | 10.13              | 5.78               | 7.02                                          | 4.95                 | 6.01                                               | 23.12                         | 19.80                                       |
| 6796               | 9.01               | 6.24               | 7.58                                          | 6.20                 | 7.53                                               | 24.96                         | 24.80                                       |
| 6797               | 8.71               | 6.20               | 7.53                                          | 6.20                 | 7.53                                               | 24.80                         | 24.80                                       |
| 6798               | 8.77               | 6.35               | 7.71                                          | 6.20                 | 7.53                                               | 25.40                         | 24.80                                       |
| 6799               | 9.14               | 5.29               | 6.42                                          | 6.18                 | 7.50                                               | 21.16                         | 24.72                                       |
| 6800               | 9.57               | 5.43               | 6.59                                          | 6.18                 | 7.50                                               | 21.72                         | 24.72                                       |
| 6801               | 9.45               | 6.32               | 7.67                                          | 6.18                 | 7.50                                               | 25.28                         | 24.72                                       |
| 6802               | 10.12              | 6.07               | 7.37                                          | 6.18                 | 7.50                                               | 24.28                         | 24.72                                       |
| 6803               | 9.89               | 6.23               | 7.56                                          | 6.18                 | 7.50                                               | 24.92                         | 24.72                                       |
| 6804               | 9.00               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                       |
| 6805               | 8.83               | 6.38               | 7.75                                          | 6.18                 | 7.50                                               | 25.52                         | 24.72                                       |
| 6806               | 10.08              | 5.85               | 7.10                                          | 6.18                 | 7.50                                               | 23.40                         | 24.72                                       |
| 6807               | 10.17              | 6.19               | 7.51                                          | 6.18                 | 7.50                                               | 24.76                         | 24.72                                       |
| 6808               | 9.93               | 5.77               | 7.00                                          | 6.18                 | 7.50                                               | 23.08                         | 24.72                                       |
| 6809               | 9.67               | 6.40               | 7.77                                          | 6.18                 | 7.50                                               | 25.60                         | 24.72                                       |
| 6810               | 9.44               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 6811               | 7.34               | 6.31               | 7.66                                          | 6.25                 | 7.59                                               | 25.24                         | 25.00                                       |
| 6812               | 6.91               | 6.88               | 8.35                                          | 6.25                 | 7.59                                               | 27.52                         | 25.00                                       |
| 6813               | 6.63               | 6.67               | 8.10                                          | 6.25                 | 7.59                                               | 26.68                         | 25.00                                       |
| 6814               | 8.65               | 6.55               | 7.95                                          | 6.25                 | 7.59                                               | 26.20                         | 25.00                                       |
| 6815               | 8.12               | 6.90               | 8.38                                          | 6.25                 | 7.59                                               | 27.60                         | 25.00                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                                                                  | Where and from Whom Collected.                            |
|--------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| 6816               | NORTH CARROLLTON COTTON OIL COMPANY,<br>North Carrollton, Miss.<br>Off Grade Cottonseed Meal.... | North Carrollton Cotton Oil Co.,<br>North Carrollton..... |
| 6817               | CANTON OIL MILL COMPANY,<br>Canton, Miss.<br>H. G. Cottonseed Meal.....                          | Canton Oil Mill Co., Canton.....                          |
| 6818               | CORINTH COTTON OIL Co.,<br>Corinth, Miss.<br>H. G. Cottonseed Meal.....                          | Corinth Cotton Oil Co., Corinth.....                      |
| 6819               | CENTREVILLE COTTON OIL Co.<br>Centreville, Miss.<br>H. G. Cottonseed Meal.....                   | Ford Bros. Co., Centreville.....                          |
| 6820               | CENTRAL COTTON OIL Co.,<br>Jackson, Miss.<br>H. G. Cottonseed Meal.....                          | Centreville Cotton Oil Co., Centreville                   |
| 6821               | H. G. Cottonseed Meal.....                                                                       | J. R. Hood, Gulfport.....                                 |
| 6822               | H. G. Cottonseed Meal.....                                                                       | Easterling Lumber Co., Ora.....                           |
| 6823               | H. G. Cottonseed Meal.....<br>DELTA OIL COMPANY,<br>Greenville, Miss.                            | Potter Bros., Lumberton.....                              |
| 6824               | S. G. Cottonseed Meal.....                                                                       | Delta Oil Company, Greenville.....                        |
| 6825               | S. G. Cottonseed Meal.....<br>DESOTO OIL COMPANY,<br>Greenville, Miss.                           | Delta Oil Company, Greenville.....                        |
| 6826               | S. G. Cottonseed Meal.....                                                                       | DeSoto Oil Co., Greenville.....                           |
| 6827               | S. G. Cottonseed Meal.....                                                                       | Threefoot Bros. & Co., Meridian.....                      |
| 6828               | S. G. Cottonseed Meal.....<br>EASTMAN OIL MILLS,<br>Jonestown, Miss.                             | DeSoto Oil Co., Greenville.....                           |
| 6829               | H. G. Cottonseed Meal.....<br>EAGLE COTTON OIL COMPANY,<br>Meridian, Miss.                       | Eastman Oil Mills, Jonestown.....                         |
| 6830               | H. G. Cottonseed Meal.....                                                                       | Forest Ginning & M'fg. Co., Forest                        |
| 6831               | H. G. Cottonseed Meal.....                                                                       | J. A. McLeod & Co., Hattiesburg.....                      |
| 6832               | H. G. Cottonseed Meal.....                                                                       | T. H. Deays, Enterprise.....                              |
| 6833               | H. G. Cottonseed Meal.....                                                                       | E. E. Bonner, Sandersville.....                           |
| 6834               | H. G. Cottonseed Meal.....                                                                       | R. W. Fagan, Waynesboro.....                              |
| 6835               | H. G. Cottonseed Meal.....                                                                       | C. T. Bonner, Enterprise.....                             |
| 6836               | H. G. Cottonseed Meal.....<br>GLEN ALLEN OIL MILL,<br>Glen Allen, Miss.                          | A. Roberts & Co., Lauderdale.....                         |
| 6837               | H. G. Cottonseed Meal.....                                                                       | Glen Allen Oil Mill, Glen Allen.....                      |
| 6838               | H. G. Cottonseed Meal.....<br>GULFPORT COTTON OIL, FERT.<br>& M'F'G. COMPANY,<br>Gulfport, Miss. | Glen Allen Oil Mill. Glen Allen.....                      |
| 6839               | H. G. Cottonseed Meal.....                                                                       | Gulfport Cotton Oil, Fert., & M'fg.<br>Co., Columbia..... |
| 6840               | H. G. Cottonseed Meal.....                                                                       | Johnson-Woodward Co., Mt. Olive...                        |



| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6816               | 7.30               | 3.87               | 4.70                                          |                      |                                                    |                               | 15.48                                       |
| 6817               | 7.78               | 6.45               | 7.83                                          | 6.18                 | 7.50                                               | 25.80                         | 24.72                                       |
| 6818               | 7.59               | 7.04               | 8.55                                          | 6.18                 | 7.50                                               | 28.16                         | 24.72                                       |
| 6819               | 6.44               | 7.19               | 8.73                                          | 6.18                 | 7.50                                               | 28.76                         | 24.72                                       |
| 6820               | 6.89               | 6.88               | 8.35                                          | 6.18                 | 7.50                                               | 27.52                         | 24.72                                       |
| 6821               | 8.18               | 6.72               | 8.16                                          | 6.18                 | 7.50                                               | 26.88                         | 24.72                                       |
| 6822               | 7.71               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | 26.32                         | 24.72                                       |
| 6823               | 7.43               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 6824               | 9.53               | 5.79               | 7.03                                          | 4.95                 | 6.01                                               | 23.16                         | 19.80                                       |
| 6825               | 9.79               | 5.87               | 7.13                                          | 4.95                 | 6.01                                               | 23.48                         | 19.80                                       |
| 6826               | 8.72               | 5.76               | 6.99                                          | 4.95                 | 6.01                                               | 23.04                         | 19.80                                       |
| 6827               | 8.10               | 5.74               | 6.97                                          | 4.95                 | 6.01                                               | 22.96                         | 19.80                                       |
| 6828               | 8.66               | 5.64               | 6.85                                          | 4.95                 | 6.01                                               | 22.56                         | 19.80                                       |
| 6829               | 7.81               | 6.20               | 7.53                                          | 6.18                 | 7.50                                               | 24.80                         | 24.72                                       |
| 6830               | 8.52               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 6831               | 6.91               | 6.99               | 8.49                                          | 6.18                 | 7.50                                               | 27.96                         | 24.72                                       |
| 6832               | 8.28               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 6833               | 6.62               | 6.89               | 8.36                                          | 6.18                 | 7.50                                               | 27.56                         | 24.72                                       |
| 6834               | 8.03               | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | 26.80                         | 24.72                                       |
| 6835               | 8.24               | 6.54               | 7.94                                          | 6.18                 | 7.50                                               | 26.16                         | 24.72                                       |
| 6836               | 8.60               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 6837               | 6.12               | 5.97               | 7.25                                          | 6.20                 | 7.53                                               | 23.88                         | 24.80                                       |
| 6838               | 6.69               | 6.09               | 7.39                                          | 6.20                 | 7.53                                               | 24.36                         | 24.80                                       |
| 6839               | 8.36               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | 26.32                         | 24.72                                       |
| 6840               | 7.99               | 7.19               | 8.73                                          | 6.18                 | 7.50                                               | 28.76                         | 24.72                                       |

TABLE I—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                                             | Where and from Whom Collected.                            |
|--------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| 6841               | H. G. Cottonseed Meal.....<br>A. H. GEORGE & COMPANY,<br>Meridian, Miss.                    | Gulfport Cotton Oil, Fert. & M'fg.<br>Co., Gulfport ..... |
| 6842               | S. G. Cottonseed Meal.....                                                                  | A. J. Lyons & Co., Meridian.....                          |
| 6843               | S. G. Cottonseed Meal.....                                                                  | Watts Merc. Co., Sandersville.....                        |
| 6844               | S. G. Cottonseed Meal.....                                                                  | Threefoot Bros. & Co., Meridian.....                      |
| 6845               | S. G. Cottonseed Meal.....<br>HAZLEHURST OIL MILL &<br>FERTILIZER Co.,<br>Hazlehurst, Miss. | L. L. Price, Toomsaba.....                                |
| 6846               | H. G. Cottonseed Meal.....                                                                  | Givens Bros., McGuffy Co., Monticello                     |
| 6847               | H. G. Cottonseed Meal.....                                                                  | Holmes Bros., McComb City.....                            |
| 6848               | H. G. Cottonseed Meal.....                                                                  | Holmes Bros., McComb City.....                            |
| 6849               | H. G. Cottonseed Meal.....                                                                  | Millr-Guy Co., McComb City.....                           |
| 6850               | H. G. Cottonseed Meal.....                                                                  | Hazlehurst Oil Mill & Fert. Co.,<br>Hazlehurst.....       |
| 6851               | H. G. Cottonseed Meal.....<br>INDIANOLA COTTON OIL Co.,<br>Indianola, Miss.                 | McComb City Merc. Co., McComb City                        |
| 6852               | S. G. Cottonseed Meal .....                                                                 | Indianola Cotton Oil Co., Indianola....                   |
| 6853               | S. G. Cottonseed Meal.....                                                                  | W. M. Sheffield, Maben.....                               |
| 6854               | S. G. Cottonseed Meal.....<br>ITTA BENA COTTON OIL Co.,<br>Itta Bena, Miss.                 | Indianola Cotton Oil Co., Indianola....                   |
| 6855               | S. G. Cottonseed Meal.....                                                                  | Itta Bena Cotton Oil Co., Itta Bena....                   |
| 6856               | S. G. Cottonseed Meal.....<br>JEFFERSON GIN & OIL MILL,<br>Harriston, Miss.                 | Itta Bena Cotton Oil Co., Itta Bena....                   |
| 6857               | H. G. Cottonseed Meal.....<br>JACKSON COTTON OIL Co.,<br>Jackson, Miss.                     | Jefferson Gin & Oil Mill, Harriston....                   |
| 6858               | H. G. Cottonseed Meal.....                                                                  | J. Carr, McCool.....                                      |
| 6859               | H. G. Cottonseed Meal.....<br>KOSCIUSKO OIL MILL & FERT.<br>COMPANY,<br>Kosciusko, Miss.    | Jackson Cotton Oil Co., Jackson.....                      |
| 6860               | H. G. Cottonseed Meal.....                                                                  | Kosciusko Oil Mill & Fert. Co., K'sko                     |
| 6861               | H. G. Cottonseed Meal.....                                                                  | Sumrall Merc. Co., Sumrall.....                           |
| 6862               | H. G. Cottonseed Meal.....<br>LAUREL OIL & FERT. Co.,<br>Laurel, Miss.                      | Hudson & Company, Sumrall.....                            |
| 6863               | H. G. Cottonseed Meal.....                                                                  | Donald & Sons, Philadelphia.....                          |
| 6864               | H. G. Cottonseed Meal.....                                                                  | R. W. Hinton Co., Lumberton.....                          |
| 6865               | H. G. Cottonseed Meal.....                                                                  | W. W. Pigford, Lumberton.....                             |
| 6866               | H. G. Cottonseed Meal.....                                                                  | J. E. McNair, Lumberton.....                              |
| 6867               | H. G. Cottonseed Meal.....                                                                  | James G. Ellis, Heidelberg.....                           |
| 6868               | H. G. Cottonseed Meal.....                                                                  | Laurel Oil & Fert. Co., Heidelberg....                    |
| 6869               | H. G. Cottonseed Meal.....                                                                  | Taylorsville Gin & Warehouse Co.,<br>Taylorsville.....    |
| 6870               | H. G. Cottonseed Meal.....                                                                  | Hicks Merc. Co., Laurel.....                              |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6841               | 7.11               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 6842               | 8.37               | 6.54               | 7.94                                          | 4.95                 | 6.01                                               | 26.16                         | 19.80                                       |
| 6843               | 8.37               | 6.58               | 7.99                                          | 4.95                 | 6.01                                               | 26.32                         | 19.80                                       |
| 6844               | 8.67               | 6.56               | 7.96                                          | 4.95                 | 6.01                                               | 26.24                         | 19.80                                       |
| 6845               | 8.29               | 6.22               | 7.55                                          | 4.95                 | 6.01                                               | 24.88                         | 19.80                                       |
| 6846               | 7.29               | 6.98               | 8.47                                          | 6.20                 | 7.53                                               | 27.92                         | 24.80                                       |
| 6847               | 7.16               | 7.29               | 8.85                                          | 6.20                 | 7.53                                               | 29.16                         | 24.80                                       |
| 6848               | 7.46               | 6.95               | 8.44                                          | 6.20                 | 7.53                                               | 27.80                         | 24.80                                       |
| 6849               | 7.78               | 6.88               | 8.35                                          | 6.20                 | 7.53                                               | 27.52                         | 24.80                                       |
| 6850               | 7.35               | 6.77               | 8.22                                          | 6.20                 | 7.53                                               | 27.08                         | 24.80                                       |
| 6851               | 7.78               | 7.15               | 8.68                                          | 6.20                 | 7.53                                               | 28.60                         | 24.80                                       |
| 6852               | 8.69               | 6.08               | 7.38                                          | 5.77                 | 7.00                                               | 24.32                         | 23.08                                       |
| 6853               | 8.73               | 5.77               | 7.00                                          | 5.77                 | 7.00                                               | 23.08                         | 23.08                                       |
| 6854               | 7.70               | 6.28               | 7.62                                          | 5.77                 | 7.00                                               | 25.12                         | 23.08                                       |
| 6855               | 7.67               | 6.04               | 7.33                                          | 5.00                 | 6.07                                               | 24.16                         | 20.00                                       |
| 6856               | 8.60               | 6.08               | 7.38                                          | 5.00                 | 6.07                                               | 24.32                         | 20.00                                       |
| 6857               | 7.95               | 6.68               | 8.11                                          | 6.18                 | 7.50                                               | 26.72                         | 24.72                                       |
| 6858               | 8.31               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 6859               | 8.63               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 6860               | 8.91               | 6.75               | 8.19                                          | 6.18                 | 7.50                                               | 27.00                         | 24.72                                       |
| 6861               | 8.31               | 6.92               | 8.40                                          | 6.18                 | 7.50                                               | 27.68                         | 24.72                                       |
| 6862               | 8.83               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | 26.56                         | 24.72                                       |
| 6863               | 7.86               | 7.08               | 8.60                                          | 6.18                 | 7.50                                               | 28.32                         | 24.72                                       |
| 6864               | 7.58               | 6.95               | 8.44                                          | 6.18                 | 7.50                                               | 27.80                         | 24.72                                       |
| 6865               | 7.99               | 7.08               | 8.60                                          | 6.18                 | 7.50                                               | 28.32                         | 24.72                                       |
| 6866               | 7.78               | 6.99               | 8.49                                          | 6.18                 | 7.50                                               | 27.96                         | 24.72                                       |
| 6867               | 7.59               | 7.04               | 8.55                                          | 6.18                 | 7.50                                               | 28.16                         | 24.72                                       |
| 6868               | 7.01               | 7.12               | 8.64                                          | 6.18                 | 7.50                                               | 28.48                         | 24.72                                       |
| 6869               | 7.70               | 6.97               | 8.46                                          | 6.18                 | 7.50                                               | 27.88                         | 24.72                                       |
| 6870               | 6.87               | 7.02               | 8.52                                          | 6.18                 | 7.50                                               | 28.08                         | 24.72                                       |



TABLE I—Analyses of Commercial Fertilizer

| Laboratory<br>Number. | Name of Brand and<br>Manufacturer.                                                          | Where and from Whom<br>Collected.                    |
|-----------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|
|                       |                                                                                             |                                                      |
| 6871                  | H. G. Cottonseed Meal.....                                                                  | Laurel Oil & Fert. Co., Laurel.....                  |
| 6872                  | H. G. Cottonseed Meal.....                                                                  | Hicks Merc. Co., Laurel.....                         |
| 6873                  | H. G. Cottonseed Meal.....<br>LELAND OIL WORKS,<br>Leland, Miss.                            | W. W. Pigford, Lumberton.....                        |
| 6875                  | S. G. Cottonseed Meal.....                                                                  | Leland Oil Works, Leland.....                        |
| 6876                  | S. G. Cottonseed Meal.....<br>LEXINGTON COMPRESS & OIL<br>MILL COMPANY,<br>Lexington, Miss. | Leland Oil Works, Leland.....                        |
| 6877                  | H. G. Cottonseed Meal.....<br>MAGNOLIA OIL MILL & M'FG.<br>COMPANY,<br>Magnolia, Miss.      | Lexington Compress & Oil Mill Co.,<br>Lexington..... |
| 6878                  | H. G. Cottonseed Meal.....                                                                  | Magnolia Oil Mill & M'fg. Co.,<br>Magnolia.....      |
| 6879                  | H. G. Cottonseed Meal.....                                                                  | Lampton Bros. & Co., Tylertown.....                  |
| 6880                  | H. G. Cottonseed Meal.....                                                                  | Magnolia Oil Mill & M'fg. Co.,<br>Magnolia.....      |
| 6881                  | H. G. Cottonseed Meal.....<br>MINTER CITY OIL WORKS,<br>Minter City, Miss.                  | The Lampton Bros. & Co., Tylertown                   |
| 6882                  | S. G. Cottonseed Meal.....<br>MISSISSIPPI COTTON OIL CO.,<br>Jackson, Miss.                 | Minter City Oil Works, Minter City....               |
| 6883                  | H. G. Cottonseed Meal.....                                                                  | Miss. Cotton Oil Co., Clarksdale.....                |
| 6884                  | H. G. Cottonseed Meal.....                                                                  | Miss. Cotton Oil Co., Clarksdale.....                |
| 6885                  | H. G. Cottonseed Meal.....                                                                  | Miss. Cotton Oil Co., Grenada.....                   |
| 6886                  | H. G. Cottonseed Meal.....                                                                  | Miss. Cotton Oil Co., Greenville.....                |
| 6887                  | H. G. Cottonseed Meal.....                                                                  | Miss. Cotton Oil Co., Greenville.....                |
| 6888                  | H. G. Cottonseed Meal.....                                                                  | Steward & Hemeter, Gandsi.....                       |
| 6889                  | H. G. Cottonseed Meal.....                                                                  | R. Watts & Co., Seminary.....                        |
| 6890                  | H. G. Cottonseed Meal.....                                                                  | D'Lo Merc. Co., D'Lo.....                            |
| 6891                  | H. G. Cottonseed Meal.....                                                                  | F. W. Locke & Co., Wiggins.....                      |
| 6892                  | H. G. Cottonseed Meal.....                                                                  | Gulfport Grocery Co., Gulfport.....                  |
| 6893                  | H. G. Cottonseed Meal.....                                                                  | J. R. Hood, Gulfport.....                            |
| 6894                  | H. G. Cottonseed Meal.....                                                                  | Merchants Grocery Co., Hattiesburg                   |
| 6895                  | H. G. Cottonseed Meal.....                                                                  | Union Naval Stores, Gulfport.....                    |
| 6896                  | H. G. Cottonseed Meal.....                                                                  | John A. McLeod Co., Hattiesburg...                   |
| 6897                  | H. G. Cottonseed Meal.....                                                                  | Gulfport Grocery Co., Gulfport.....                  |
| 6898                  | H. G. Cottonseed Meal.....                                                                  | Gulfport Grocery Co., Gulfport.....                  |
| 6899                  | H. G. Cottonseed Meal.....                                                                  | Bonner & Co., Wiggins.....                           |
| 6900                  | H. G. Cottonseed Meal.....                                                                  | McInnis & Stephens, Poplarville.....                 |
| 6901                  | H. G. Cottonseed Meal.....                                                                  | Osyka Merc. Co., Osyka.....                          |
| 6902                  | H. G. Cottonseed Meal.....                                                                  | W. H. Gallaspy's Sons Co., Hickory...                |
| 6903                  | H. G. Cottonseed Meal.....                                                                  | Johnson-Woodward Co., Mt. Olive...                   |
| 6904                  | H. G. Cottonseed Meal.....                                                                  | O. Hopkins, Hickory.....                             |
| 6905                  | H. G. Cottonseed Meal.....                                                                  | W. A. Lyle, Lauderdale.....                          |
| 6906                  | H. G. Cottonseed Meal.....                                                                  | J. J. Shelby, Toomsuaba.....                         |
| 6907                  | H. G. Cottonseed Meal.....                                                                  | J. E. Bounds, Vossburg.....                          |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen<br>Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|----------------------|-----------------------------------------------|-------------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6871               | 7.99               | 6.77                 | 8.22                                          | 6.18                    | 7.50                                               | 27.08                         | 24.72                                       |
| 6872               | 7.34               | 6.88                 | 8.35                                          | 6.18                    | 7.50                                               | 27.52                         | 24.72                                       |
| 6873               | 8.04               | 6.99                 | 8.49                                          | 6.18                    | 7.50                                               | 27.96                         | 24.72                                       |
| 6875               | 8.31               | 6.14                 | 7.45                                          | 4.95                    | 6.01                                               | 24.56                         | 19.80                                       |
| 6876               | 8.19               | 6.23                 | 7.56                                          | 4.95                    | 6.01                                               | 24.92                         | 19.80                                       |
| 6877               | 9.64               | 6.19                 | 7.51                                          | 6.18                    | 7.50                                               | 24.76                         | 24.72                                       |
| 6878               | 8.32               | 7.34                 | 8.91                                          | 6.18                    | 7.50                                               | 29.36                         | 24.72                                       |
| 6879               | 11.84              | 6.81                 | 8.27                                          | 6.18                    | 7.50                                               | 27.24                         | 24.72                                       |
| 6880               | 8.45               | 7.03                 | 8.53                                          | 6.18                    | 7.50                                               | 28.12                         | 24.72                                       |
| 6881               | 8.59               | 6.81                 | 8.27                                          | 6.18                    | 7.50                                               | 27.24                         | 24.72                                       |
| 6882               | 9.26               | 6.17                 | 7.49                                          | 5.00                    | 6.07                                               | 24.68                         | 20.00                                       |
| 6883               | 7.98               | 6.40                 | 7.77                                          | 6.18                    | 7.50                                               | 25.60                         | 24.72                                       |
| 6884               | 8.93               | 6.15                 | 7.47                                          | 6.18                    | 7.50                                               | 24.60                         | 24.72                                       |
| 6885               | 8.40               | 6.18                 | 7.50                                          | 6.18                    | 7.50                                               | 24.72                         | 24.72                                       |
| 6886               | 9.15               | 6.20                 | 7.53                                          | 6.18                    | 7.50                                               | 24.80                         | 24.72                                       |
| 6887               | 8.45               | 6.25                 | 7.59                                          | 6.18                    | 7.50                                               | 25.00                         | 24.72                                       |
| 6888               | 9.15               | 6.40                 | 7.77                                          | 6.18                    | 7.50                                               | 25.60                         | 24.72                                       |
| 6889               | 9.31               | 7.07                 | 8.58                                          | 6.18                    | 7.50                                               | 28.28                         | 24.72                                       |
| 6890               | 9.69               | 6.37                 | 7.73                                          | 6.18                    | 7.50                                               | 25.48                         | 24.72                                       |
| 6891               | 9.41               | 6.15                 | 7.47                                          | 6.18                    | 7.50                                               | 24.60                         | 24.72                                       |
| 6892               | 9.17               | 6.49                 | 7.88                                          | 6.18                    | 7.50                                               | 25.96                         | 24.72                                       |
| 6893               | 9.13               | 6.43                 | 7.81                                          | 6.18                    | 7.50                                               | 25.72                         | 24.72                                       |
| 6894               | 9.49               | 6.64                 | 8.06                                          | 6.18                    | 7.50                                               | 26.56                         | 24.72                                       |
| 6895               | 10.40              | 6.53                 | 7.93                                          | 6.18                    | 7.50                                               | 26.12                         | 24.72                                       |
| 6896               | 7.24               | 6.33                 | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 6897               | 9.34               | 6.27                 | 7.61                                          | 6.18                    | 7.50                                               | 25.08                         | 24.72                                       |
| 6898               | 9.25               | 6.51                 | 7.90                                          | 6.18                    | 7.50                                               | 26.04                         | 24.72                                       |
| 6899               | 9.04               | 7.32                 | 8.89                                          | 6.18                    | 7.50                                               | 29.28                         | 24.72                                       |
| 6900               | 9.33               | 6.20                 | 7.53                                          | 6.18                    | 7.50                                               | 24.80                         | 24.72                                       |
| 6901               | 9.60               | 6.64                 | 8.06                                          | 6.18                    | 7.50                                               | 26.56                         | 24.72                                       |
| 6902               | 10.08              | 6.59                 | 8.00                                          | 6.18                    | 7.50                                               | 26.36                         | 24.72                                       |
| 6903               | 10.18              | 6.87                 | 8.34                                          | 6.18                    | 7.50                                               | 27.48                         | 24.72                                       |
| 6904               | 9.66               | 6.34                 | 7.70                                          | 6.18                    | 7.50                                               | 25.36                         | 24.72                                       |
| 6905               | 6.07               | 6.31                 | 7.66                                          | 6.18                    | 7.50                                               | 25.24                         | 24.72                                       |
| 6906               | 8.91               | 6.42                 | 7.79                                          | 6.18                    | 7.50                                               | 25.68                         | 24.72                                       |
| 6907               | 7.38               | 6.53                 | 7.93                                          | 6.18                    | 7.50                                               | 26.12                         | 24.72                                       |

TABLE I—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.            | Where and from Whom Collected.                    |
|--------------------|--------------------------------------------|---------------------------------------------------|
| 6908               | H. G. Cottonseed Meal.....                 | Stephens & Ruffan, New Augusta.....               |
| 6909               | H. G. Cottonseed Meal.....                 | Johnson & Hand, Ellisville.....                   |
| 6910               | H. G. Cottonseed Meal.....                 | W. M. Hyde & Co., Poplarville.....                |
| 6911               | H. G. Cottonseed Meal.....                 | Biloxi Milling Co., Biloxi.....                   |
| 6912               | H. G. Cottonseed Meal.....                 | J. J. Shelby, Toomsaba.....                       |
| 6913               | H. G. Cottonseed Meal.....                 | Miss. Cotton Oil Co., Meridian.....               |
| 6914               | H. G. Cottonseed Meal.....                 | Johnson & Hand, Ellisville.....                   |
| 6915               | H. G. Cottonseed Meal.....                 | Miss. & Ala. Co-operative Co.,<br>State Line..... |
| 6916               | H. G. Cottonseed Meal.....                 | McLeod & Co., Purvis.....                         |
| 6917               | H. G. Cottonseed Meal.....                 | James O'Connell, Purvis.....                      |
| 6918               | H. G. Cottonseed Meal.....                 | O. Hopkins, Hickory.....                          |
| 6919               | H. G. Cottonseed Meal.....                 | Miss. Cotton Oil Co., Natchez.....                |
| 6920               | H. G. Cottonseed Meal.....                 | J. B. Mitchell, Ackerman.....                     |
| 6921               | H. G. Cottonseed Meal.....                 | Miss. Cotton Oil Co., West Point.....             |
| 6922               | H. G. Cottonseed Meal.....                 | S. D. Turner, North Carrollton.....               |
| 6923               | H. G. Cottonseed Meal.....                 | Miss. Cotton Oil Co., Yazoo City.....             |
| 6924               | H. G. Cottonseed Meal.....                 | Miss. Cotton Oil Co., Yazoo City.....             |
| 6925               | H. G. Cottonseed Meal.....                 | J. B. McClelland, Wesson.....                     |
|                    | MERIDIAN FERT. FACTORY,<br>Meridian, Miss. |                                                   |
| 6926               | H. G. Cottonseed Meal.....                 | H. M. Stuart, Morton.....                         |
| 6927               | H. G. Cottonseed Meal.....                 | Meridian Fert. Factory, Hattiesburg.....          |
| 6928               | H. G. Cottonseed Meal.....                 | Holloway & Worthy, Carson.....                    |
| 6929               | H. G. Cottonseed Meal.....                 | Hawkins, McRaney Co., Bassfield.....              |
| 6930               | H. G. Cottonseed Meal.....                 | J. H. Williams & Sons, Prentiss.....              |
| 6931               | H. G. Cottonseed Meal.....                 | Meridian Fert. Factory, Hattiesburg.....          |
| 6932               | H. G. Cottonseed Meal.....                 | L. N. Nobler, State Line.....                     |
| 6933               | H. G. Cottonseed Meal.....                 | J. K. Kirkland, Quitman.....                      |
| 6934               | H. G. Cottonseed Meal.....                 | J. D. Pickett, Toomsaba.....                      |
| 6935               | H. G. Cottonseed Meal.....                 | Bufkin & Davis, Waynesboro.....                   |
| 6937               | H. G. Cottonseed Meal.....                 | Buckley & Son, Enterprise.....                    |
| 6938               | H. G. Cottonseed Meal.....                 | Lucedale Commercial Co., Lucedale.....            |
| 6939               | H. G. Cottonseed Meal.....                 | Montrose Merc. Co., Montrose.....                 |
| 6940               | H. G. Cottonseed Meal.....                 | Lyon Bros., Heidelberg.....                       |
| 6941               | H. G. Cottonseed Meal.....                 | J. L. Wells, Hickory.....                         |
| 6942               | H. G. Cottonseed Meal.....                 | R. F. Waldron & Co., Prentiss.....                |
| 6943               | H. G. Cottonseed Meal.....                 | Hawkins & Co., Hattiesburg.....                   |
|                    | MOORHEAD OIL COMPANY,<br>Moorhead, Miss.   |                                                   |
| 6944               | S. G. Cottonseed Meal.....                 | Moorhead Oil Co., Moorhead.....                   |
| 6945               | S. G. Cottonseed Meal.....                 | Moorhead Oil Co., Moorhead.....                   |
| 6946               | S. G. Cottonseed Meal.....                 | Moorhead Oil Co., Moorhead.....                   |
|                    | NEWTON OIL & M'F'G. Co.,<br>Newton, Miss.  |                                                   |
| 6947               | H. G. Cottonseed Meal.....                 | T. L. Peebles, Philadelphia.....                  |
| 6948               | H. G. Cottonseed Meal.....                 | J. J. Gaines, Decatur.....                        |
| 6949               | H. G. Cottonseed Meal.....                 | Smythe-Gaddis & Co., Forest.....                  |
| 6950               | H. G. Cottonseed Meal.....                 | Newton Oil & M'f'g. Co., Philadelphia.....        |
| 6951               | H. G. Cottonseed Meal.....                 | Newton Oil & M'f'g. Co., Newton.....              |



| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—found. | Nitrogen<br>Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|-------------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6908               | 8.58               | 6.50               | 7.89                                          | 6.18                    | 7.50                                               | 26.00                         | 24.72                                       |
| 6909               | 9.16               | 6.83               | 8.29                                          | 6.18                    | 7.50                                               | 27.32                         | 24.72                                       |
| 6910               | 9.53               | 6.55               | 7.95                                          | 6.18                    | 7.50                                               | 26.20                         | 24.72                                       |
| 6911               | 10.55              | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 6912               | 9.49               | 6.49               | 7.88                                          | 6.18                    | 7.50                                               | 25.96                         | 24.72                                       |
| 6913               | 7.83               | 6.89               | 8.36                                          | 6.18                    | 7.50                                               | 27.56                         | 24.72                                       |
| 6914               | 8.91               | 6.60               | 8.01                                          | 6.18                    | 7.50                                               | 26.40                         | 24.72                                       |
| 6915               | 10.79              | 6.74               | 8.18                                          | 6.18                    | 7.50                                               | 26.96                         | 24.72                                       |
| 6916               | 9.20               | 6.66               | 8.09                                          | 6.18                    | 7.50                                               | 26.64                         | 24.72                                       |
| 6917               | 9.61               | 6.48               | 7.87                                          | 6.18                    | 7.50                                               | 25.92                         | 24.72                                       |
| 6918               | 8.99               | 6.82               | 8.28                                          | 6.18                    | 7.50                                               | 27.28                         | 24.72                                       |
| 6919               | 8.28               | 6.50               | 7.89                                          | 6.18                    | 7.50                                               | 26.00                         | 24.72                                       |
| 6920               | 9.42               | 6.73               | 8.17                                          | 6.18                    | 7.50                                               | 26.92                         | 24.72                                       |
| 6921               | 9.50               | 6.52               | 7.92                                          | 6.18                    | 7.50                                               | 26.08                         | 24.72                                       |
| 6922               | 9.79               | 6.37               | 7.73                                          | 6.18                    | 7.50                                               | 25.48                         | 24.72                                       |
| 6923               | 7.70               | 6.34               | 7.70                                          | 6.18                    | 7.50                                               | 25.36                         | 24.72                                       |
| 6924               | 7.17               | 6.10               | 7.41                                          | 6.18                    | 7.50                                               | 24.40                         | 24.72                                       |
| 6925               | 7.03               | 6.39               | 7.76                                          | 6.18                    | 7.50                                               | 25.56                         | 24.72                                       |
| 6926               | 9.71               | 6.67               | 8.10                                          | 6.18                    | 7.50                                               | 26.68                         | 24.72                                       |
| 6927               | 7.83               | 6.96               | 8.45                                          | 6.18                    | 7.50                                               | 27.84                         | 24.72                                       |
| 6928               | 7.88               | 6.25               | 7.59                                          | 6.18                    | 7.50                                               | 25.00                         | 24.72                                       |
| 6929               | 8.31               | 7.21               | 8.35                                          | 6.18                    | 7.50                                               | 28.84                         | 24.72                                       |
| 6930               | 8.82               | 6.88               | 8.35                                          | 6.18                    | 7.50                                               | 27.52                         | 24.72                                       |
| 6931               | 8.05               | 7.27               | 8.83                                          | 6.18                    | 7.50                                               | 29.08                         | 24.72                                       |
| 6932               | 9.77               | 6.61               | 8.02                                          | 6.18                    | 7.50                                               | 26.44                         | 24.72                                       |
| 6933               | 8.76               | 6.91               | 8.39                                          | 6.18                    | 7.50                                               | 27.64                         | 24.72                                       |
| 6934               | 9.90               | 6.64               | 8.06                                          | 6.18                    | 7.50                                               | 26.56                         | 24.72                                       |
| 6935               | 8.38               | 7.04               | 8.55                                          | 6.18                    | 7.50                                               | 28.16                         | 24.72                                       |
| 6937               | 9.56               | 6.72               | 8.16                                          | 6.18                    | 7.50                                               | 26.88                         | 24.72                                       |
| 6938               | 8.48               | 6.98               | 8.47                                          | 6.18                    | 7.50                                               | 27.92                         | 24.72                                       |
| 6939               | 8.58               | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 6940               | 8.97               | 6.98               | 8.47                                          | 6.18                    | 7.50                                               | 27.92                         | 24.72                                       |
| 6941               | 9.48               | 6.68               | 8.11                                          | 6.18                    | 7.50                                               | 26.72                         | 24.72                                       |
| 6942               | 9.42               | 6.18               | 7.50                                          | 6.18                    | 7.50                                               | 24.72                         | 24.72                                       |
| 6943               | 6.83               | 7.17               | 8.70                                          | 6.18                    | 7.50                                               | 28.68                         | 24.72                                       |
| 6944               | 7.94               | 5.47               | 6.64                                          | 4.95                    | 6.01                                               | 21.88                         | 19.80                                       |
| 6945               | 9.16               | 5.05               | 6.13                                          | 4.95                    | 6.01                                               | 20.20                         | 19.80                                       |
| 6946               | 9.07               | 5.12               | 6.22                                          | 4.95                    | 6.01                                               | 20.48                         | 19.80                                       |
| 6947               | 7.09               | 6.69               | 8.12                                          | 6.18                    | 7.50                                               | 26.76                         | 24.72                                       |
| 6948               | 6.53               | 6.83               | 8.29                                          | 6.18                    | 7.50                                               | 27.32                         | 24.72                                       |
| 6949               | 8.31               | 6.46               | 7.84                                          | 6.18                    | 7.50                                               | 25.84                         | 24.72                                       |
| 6950               | 6.95               | 7.23               | 8.78                                          | 6.18                    | 7.50                                               | 28.92                         | 24.72                                       |
| 6951               | 6.73               | 6.97               | 8.46                                          | 6.18                    | 7.50                                               | 27.88                         | 24.72                                       |

TABLE 1—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                                      | Where and from Whom Collected.          |
|--------------------|--------------------------------------------------------------------------------------|-----------------------------------------|
| 6952               | H. G. Cottonseed Meal.....                                                           | M. A. Metts, Louisville.....            |
| 6953               | H. G. Cottonseed Meal.....                                                           | J. T. Lewis, Neshoba.....               |
| 6954               | H. G. Cottonseed Meal.....                                                           | Newton Oil & M'fg. Co., Decatur.....    |
| 6955               | H. G. Cottonseed Meal.....                                                           | Newton Oil & M'fg. Co., Newton.....     |
| 6956               | H. G. Cottonseed Meal.....<br>NORTH MISSISSIPPI OIL MILL,<br>Holly Springs, Miss.    | Newton Oil & M'fg. Co., Louisville....  |
| 6957               | H. G. Cottonseed Meal.....<br>NATCHEZ OIL COMPANY,<br>Natchez, Miss.                 | North Miss. Oil Mill, Holly Springs.... |
| 6958               | S. G. Cottonseed Meal.....<br>NEW ALBANY OIL MILL Co.,<br>New Albany, Miss.          | Natchez Oil Company, Natchez.....       |
| 6959               | O. G. Cottonseed Meal.....                                                           | S. M. Hinton, Bay Springs.....          |
| 6960               | O. G. Cottonseed Meal.....<br>OKOLONA COTTON OIL Co.,<br>Okolona, Miss.              | New Albany Oil Mill Co., New Albany     |
| 6962               | S. G. Cottonseed Meal.....<br>OXFORD COTTON OIL Co.,<br>Oxford, Miss.                | Okolona Cotton Oil Co., Okolona.....    |
| 6963               | S. G. Cottonseed Meal.....<br>PLANTERS GIN & OIL Co.,<br>Baldwyn, Miss.              | Oxford Cotton Oil Co., Oxford.....      |
| 6964               | H. G. Cottonseed Meal.....                                                           | Planters Gin & Oil Co., Baldwyn.....    |
| 6965               | H. G. Cottonseed Meal.....<br>PICKENS COTTON OIL Co.,<br>Pickens, Miss.              | Philips, Rhinhart, Taylor Co., Boonev'e |
| 6966               | S. G. Cottonseed Meal.....<br>PIEDMONT OIL & REFINING<br>COMPANY,<br>Faunsdale, Ala. | Pickens Cotton Oil Co., Pickens.....    |
| 6967               | H. G. Cottonseed Meal.....                                                           | A. L. Lyon, Meridian.....               |
| 6968               | H. G. Cottonseed Meal.....<br>PRODUCERS COTTON OIL Co.,<br>Yazoo City, Miss.         | Winner, Klien & Co., Meridian.....      |
| 6969               | H. G. Cottonseed Meal.....<br>PHOENIX COTTON OIL Co.,<br>Como, Miss.                 | Smythe, Gaddis & Co., Forest.....       |
| 6970               | S. G. Cottonseed Meal.....<br>PLANTERS OIL MILL,<br>Tunica, Miss.                    | Phoenix Cotton Oil Co., Como.....       |
| 6971               | S. G. Cottonseed Meal.....<br>PONTOTOC COTTON OIL Co.,<br>Pontotoc, Miss.            | Planters Oil Mill, Tunica.....          |
| 6973               | H. G. Cottonseed Meal.....<br>PLANTERS OIL WORKS,<br>Clarksdale, Miss.               | Pontotoc Cotton Oil Co., Pontotoc.....  |
| 6974               | S. G. Cottonseed Meal.....                                                           | Planters Oil Works, Clarksdale.....     |
| 6975               | S. G. Cottonseed Meal.....                                                           | Planters Oil Works, Clarksdale.....     |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6952               | 7.29               | 6.66               | 8.09                                          | 6.18                 | 7.50                                               | 26.64                         | 24.72                                       |
| 6953               | 6.42               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 6954               | 6.00               | 6.68               | 8.11                                          | 6.18                 | 7.50                                               | 26.72                         | 24.72                                       |
| 6955               | 7.29               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 6956               | 7.62               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |
| 6957               | 7.76               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                       |
| 6958               | 7.51               | 6.73               | 8.17                                          | 5.00                 | 6.07                                               | 26.92                         | 20.00                                       |
| 6959               | 10.40              | 3.50               | 4.25                                          | 3.30                 | 4.01                                               | 14.00                         | 13.20                                       |
| 6960               | 9.53               | 3.60               | 4.73                                          | 3.30                 | 4.01                                               | 15.20                         | 13.20                                       |
| 6962               | 7.54               | 6.95               | 8.44                                          | 4.95                 | 6.01                                               | 27.80                         | 19.80                                       |
| 6963               | 8.11               | 6.11               | 7.42                                          | 4.95                 | 6.01                                               | 24.44                         | 19.80                                       |
| 6964               | 8.08               | 7.23               | 8.78                                          | 6.18                 | 7.50                                               | 28.92                         | 24.72                                       |
| 6965               | 8.40               | 6.31               | 7.66                                          | 6.18                 | 7.50                                               | 25.24                         | 24.72                                       |
| 6966               | 7.11               | 6.13               | 7.44                                          | 5.00                 | 6.07                                               | 24.52                         | 20.00                                       |
| 6967               | 8.30               | 6.35               | 7.71                                          | 6.18                 | 7.50                                               | 25.40                         | 24.72                                       |
| 6968               | 9.22               | 6.21               | 7.54                                          | 6.18                 | 7.50                                               | 24.84                         | 24.72                                       |
| 6969               | 8.94               | 6.14               | 7.45                                          | 6.25                 | 7.59                                               | 24.56                         | 25.00                                       |
| 6970               | 8.57               | 5.94               | 7.21                                          | 4.95                 | 6.01                                               | 23.76                         | 19.80                                       |
| 6971               | 7.93               | 6.01               | 7.30                                          | 4.95                 | 6.01                                               | 24.04                         | 19.80                                       |
| 6973               | 8.28               | 6.61               | 8.02                                          | 6.18                 | 7.50                                               | 26.44                         | 24.72                                       |
| 6974               | 6.15               | 5.78               | 7.02                                          | 5.00                 | 6.07                                               | 23.12                         | 20.00                                       |
| 6975               | 9.23               | 6.07               | 7.37                                          | 5.00                 | 6.07                                               | 24.28                         | 20.00                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                       | Where and from Whom Collected.          |
|--------------------|-------------------------------------------------------|-----------------------------------------|
|                    | PORT GIBSON OIL WORKS,<br>Port Gibson, Miss.          |                                         |
| 6976               | S. G. Cottonseed Meal.....                            | Port Gibson Oil Works, Port Gibson....  |
| 6977               | S. G. Cottonseed Meal.....                            | C. J. Edwards Co., Vicksburg.....       |
| 6978               | S. G. Cottonseed Meal.....                            | W. O. Worell, Vicksburg.....            |
|                    | REFUGE COTTON OIL CO.,<br>Vicksburg, Miss.            |                                         |
| 6979               | S. G. Cottonseed Meal.....                            | Refuge Cotton Oil Co., Rosedale.....    |
| 6980               | S. G. Cottonseed Meal.....                            | Refuge Cotton Oil Co., Rosedale.....    |
| 6981               | S. G. Cottonseed Meal.....                            | Refuge Cotton Oil Co., Greenville.....  |
| 6982               | S. G. Cottonseed Meal.....                            | Refuge Cotton Oil Co., Greenville.....  |
| 6983               | S. G. Cottonseed Meal.....                            | Hanes & Hood, Vicksburg.....            |
|                    | ROLLING FORK OIL COMPANY,<br>Rolling Fork, Miss.      |                                         |
| 6984               | S. G. Cottonseed Meal.....                            | Rolling Fork Oil Co., Rolling Fork....  |
| 6985               | S. G. Cottonseed Meal.....                            | Rolling Fork Oil Co., Rolling Fork..... |
|                    | SARDIS OIL COMPANY,<br>Sardis, Miss.                  |                                         |
| 6987               | H. G. Cottonseed Meal.....                            | Sardis Oil Company, Sardis.....         |
|                    | SUMMIT GIN & IMPROVEMENT<br>COMPANY,<br>Summit, Miss. |                                         |
| 6988               | S. G. Cottonseed Meal.....                            | Hyman Merc. Co., Summit.....            |
|                    | SOUTHERN OIL & FERT. CO.,<br>Meridian, Miss.          |                                         |
| 6989               | H. G. Cottonseed Meal.....                            | Southern Oil & Fert. Co., Meridian....  |
| 6990               | H. G. Cottonseed Meal.....                            | Southern Oil & Fert. Co., Meridian..... |
| 6991               | H. G. Cottonseed Meal.....                            | J. P. Meyer, Ellisville.....            |
| 6992               | H. G. Cottonseed Meal.....                            | Southern Oil & Fert. Co., Meridian....  |
| 6993               | H. G. Cottonseed Meal.....                            | Tom Lyle Grocery Co., Meridian.....     |
| 6994               | H. G. Cottonseed Meal.....                            | Dunagin Whitaker Co., Laurel.....       |
|                    | SHUBUTA OIL & M'F'G. CO.,<br>Shubuta, Miss.           |                                         |
| 6995               | H. G. Cottonseed Meal.....                            | Shubuta Oil & M'f'g. Co., Shubuta....   |
| 6996               | H. G. Cottonseed Meal.....                            | Shubuta Oil & M'f'g. Co., Shubuta....   |
|                    | SHELBY OIL COMPANY,<br>Shelby, Miss.                  |                                         |
| 6997               | H. G. Cottonseed Meal.....                            | Shelby Oil Company, Shelby.....         |
| 6998               | H. G. Cottonseed Meal.....                            | Shelby Oil Company, Shelby.....         |
|                    | SENATOBIA OIL COMPANY,<br>Senatobia, Miss.            |                                         |
| 6999               | S. G. Cottonseed Meal.....                            | Senatobia Oil Co., Senatobia.....       |
|                    | SULLIGENT COTTON OIL CO.,<br>Sulligent, Ala.          |                                         |
| 7129               | H. G. Cottonseed Meal.....                            | J. Niles Boyd, Kosciusko.....           |
|                    | STARKVILLE COTTON OIL CO.,<br>Starkville, Miss.       |                                         |
| 7000               | H. G. Cottonseed Meal.....                            | T. B. Bonner Co., Laurel.....           |
|                    | TUPELO OIL & ICE COMPANY,<br>Tupelo, Miss.            |                                         |
| 7001               | H. G. Cottonseed Meal.....                            | Tupelo Oil & Ice Co., Tupelo.....       |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen Per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 6976               | 8.04               | 5.98               | 7.26                                          | 5.00                 | 6.07                                               | 23.92                         | 20.00                                       |
| 6977               | 8.06               | 6.19               | 7.51                                          | 5.00                 | 6.07                                               | 24.76                         | 20.00                                       |
| 6978               | 6.99               | 6.38               | 7.75                                          | 5.00                 | 6.07                                               | 25.52                         | 20.00                                       |
| 6979               | 8.58               | 5.98               | 7.26                                          | 4.96                 | 6.02                                               | 23.92                         | 19.84                                       |
| 6980               | 9.66               | 5.79               | 7.03                                          | 4.96                 | 6.02                                               | 23.16                         | 19.84                                       |
| 6981               | 9.56               | 5.53               | 6.71                                          | 4.96                 | 6.02                                               | 22.12                         | 19.84                                       |
| 6982               | 7.69               | 5.08               | 6.17                                          | 4.96                 | 6.02                                               | 20.32                         | 19.84                                       |
| 6983               | 7.59               | 5.88               | 7.14                                          | 4.96                 | 6.02                                               | 23.52                         | 19.84                                       |
| 6984               | 7.00               | 6.47               | 7.85                                          | 5.00                 | 6.07                                               | 25.88                         | 20.00                                       |
| 6985               | 8.10               | 6.00               | 7.28                                          | 5.00                 | 6.07                                               | 24.00                         | 20.00                                       |
| 6987               | 7.81               | 6.00               | 7.28                                          | 6.20                 | 7.53                                               | 24.00                         | 24.80                                       |
| 6988               | 9.43               | 7.19               | 8.73                                          | 4.95                 | 6.01                                               | 28.76                         | 19.80                                       |
| 6989               | 8.13               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 6990               | 7.64               | 6.75               | 8.19                                          | 6.18                 | 7.50                                               | 27.00                         | 24.72                                       |
| 6991               | 7.82               | 6.72               | 8.16                                          | 6.18                 | 7.50                                               | 26.88                         | 24.72                                       |
| 6992               | 7.96               | 6.56               | 7.96                                          | 6.18                 | 7.50                                               | 26.24                         | 24.72                                       |
| 6993               | 8.47               | 6.61               | 8.02                                          | 6.18                 | 7.50                                               | 26.44                         | 24.72                                       |
| 6994               | 7.92               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |
| 6995               | 7.96               | 6.44               | 7.82                                          | 6.18                 | 7.50                                               | 25.76                         | 24.72                                       |
| 6996               | 8.89               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 6997               | 7.12               | 6.11               | 7.42                                          | 6.25                 | 7.59                                               | 24.44                         | 25.00                                       |
| 6998               | 8.35               | 6.37               | 7.73                                          | 6.25                 | 7.59                                               | 25.48                         | 25.00                                       |
| 6999               | 8.44               | 5.73               | 6.96                                          | 4.95                 | 6.01                                               | 22.92                         | 19.80                                       |
| 7129               | 9.04               | 6.54               | 7.94                                          | 6.20                 | 7.53                                               | 26.16                         | 24.80                                       |
| 7000               | 7.66               | 6.88               | 8.35                                          | 6.40                 | 7.77                                               | 27.52                         | 25.60                                       |
| 7001               | 7.59               | 7.06               | 8.57                                          | 6.20                 | 7.53                                               | 28.24                         | 24.80                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                        | Where and from Whom Collected.                  |
|--------------------|--------------------------------------------------------|-------------------------------------------------|
|                    | C. A. TINDALL COMPANY,<br>Memphis, Tenn.               |                                                 |
| 7002               | O. G. Cottonseed Meal.....                             | T. C. Ruble, McHenry.....                       |
| 7003               | O. G. Cottonseed Meal.....                             | Kennedy & Co., Wiggins.....                     |
| 7004               | O. G. Cottonseed Meal.....                             | Mars Bros., Philadelphia.....                   |
| 7005               | O. G. Cottonseed Meal.....                             | The Lampton Co., Columbia.....                  |
| 7006               | O. G. Cottonseed Meal.....                             | The Lampton Co., Columbia.....                  |
| 7007               | O. G. Cottonseed Meal.....                             | Lampton & Rawls Co., Mt. Olive.....             |
|                    | TENNESSEE FIBRE COMPANY,<br>Memphis, Tenn.             |                                                 |
| 7008               | O. G. Cottonseed Meal.....                             | Doyle Kervin, Collins.....                      |
| 7009               | O. G. Cottonseed Meal.....                             | Donald Bros., Magee.....                        |
| 7010               | O. G. Cottonseed Meal.....                             | Gulfport Grocery Co., Gulfport.....             |
| 7011               | O. G. Cottonseed Meal.....                             | The Batson-Bond Co., Bond.....                  |
| 7012               | O. G. Cottonseed Meal.....                             | Gulfport Grocery Co., Gulfport.....             |
| 7013               | O. G. Cottonseed Meal.....                             | Hattiesburg Grocery Co., Hattiesburg.....       |
| 7014               | O. G. Cottonseed Meal.....                             | Hicks Merc. Co., Laurel.....                    |
| 7015               | O. G. Cottonseed Meal.....                             | Donald Bros. Merc. Co., New Hebron.....         |
| 7016               | O. G. Cottonseed Meal.....                             | Foote-Patrick Co., Laurel.....                  |
| 7017               | O. G. Cottonseed Meal.....                             | Gulfport Grain & Elevator Co.,<br>Gulfport..... |
| 7018               | O. G. Cottonseed Meal.....                             | Gulfport Grocery Co., Gulfport.....             |
| 7019               | O. G. Cottonseed Meal.....                             | Goss & Wilkes, Columbia.....                    |
| 7020               | O. G. Cottonseed Meal.....                             | Rawls & Lampton Co., Silver Creek.....          |
| 7021               | O. G. Cottonseed Meal.....                             | D. C. Griffith, Silver Creek.....               |
|                    | TENNESSEE COTTON OIL Co.,<br>Memphis, Tenn.            |                                                 |
| 7022               | H. G. Cottonseed Meal.....                             | C. M. Elder, New Albany.....                    |
|                    | VICKSBURG COTTON OIL Co.,<br>Vicksburg, Miss.          |                                                 |
| 7023               | S. G. Cottonseed Meal.....                             | Gulfport Grocery Co., Gulfport.....             |
| 7024               | S. G. Cottonseed Meal.....                             | Gulfport Grocery Co., Gulfport.....             |
| 7025               | S. G. Cottonseed Meal.....                             | Kola Lumber Co., Kola.....                      |
| 7026               | S. G. Cottonseed Meal.....                             | Rouse Bros. & Smith, Poplarville.....           |
| 7027               | S. G. Cottonseed Meal.....                             | Vicksburg Cotton Oil Co., Vicksburg.....        |
| 7028               | S. G. Cottonseed Meal.....                             | R. H. Day, Decatur.....                         |
|                    | WINONA OIL & M'FG. Co.,<br>Winona, Miss.               |                                                 |
| 7029               | H. G. Cottonseed Meal.....                             | Winona Oil & M'fg. Co., Winona.....             |
| 7032               | H. G. Cottonseed Meal.....                             | C. W. Alexander, Montrose.....                  |
| 7030               | S. G. Cottonseed Meal.....                             | Winona Oil & M'fg. Co., Winona.....             |
| 7031               | S. G. Cottonseed Meal.....                             | The Lampton Co., Columbia.....                  |
|                    | WESSON COTTON OIL & FERT.<br>COMPANY,<br>Wesson, Miss. |                                                 |
| 7033               | H. G. Cottonseed Meal.....                             | Wesson Cotton Oil & Fert. Co., Wesson.....      |
|                    | BELZONI COTTON OIL Co.,<br>Belzoni, Miss.              |                                                 |
| 6784               | H. G. Cottonseed Meal.....                             | Belzoni Cotton Oil Co., Belzoni.....            |



| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—found. | Nitrogen<br>Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of<br>Nitrogen per Ton. | Value of<br>Nitrogen Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|-------------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 7002               | 9.24               | 3.72               | 4.52                                          | 3.52                    | 4.27                                               | 14.88                         | 14.08                                       |
| 7003               | 10.11              | 3.69               | 4.53                                          | 3.52                    | 4.27                                               | 14.76                         | 14.08                                       |
| 7004               | 9.16               | 3.30               | 4.01                                          | 3.52                    | 4.27                                               | 13.20                         | 14.08                                       |
| 7005               | 9.57               | 3.32               | 4.03                                          | 3.52                    | 4.27                                               | 13.28                         | 14.08                                       |
| 7006               | 8.77               | 3.57               | 4.33                                          | 3.52                    | 4.27                                               | 14.28                         | 14.08                                       |
| 7007               | 9.04               | 3.49               | 4.24                                          | 3.52                    | 4.27                                               | 13.96                         | 14.08                                       |
| 7008               | 9.66               | 3.88               | 4.71                                          | 3.52                    | 4.27                                               | 15.52                         | 14.08                                       |
| 7009               | 9.66               | 4.02               | 4.88                                          | 3.52                    | 4.27                                               | 16.08                         | 14.08                                       |
| 7010               | 8.65               | 3.42               | 4.15                                          | 3.52                    | 4.27                                               | 13.68                         | 14.08                                       |
| 7011               | 9.11               | 3.73               | 4.53                                          | 3.52                    | 4.27                                               | 14.92                         | 14.08                                       |
| 7012               | 9.95               | 3.50               | 4.25                                          | 3.52                    | 4.27                                               | 14.00                         | 14.08                                       |
| 7013               | 9.02               | 3.76               | 4.56                                          | 3.52                    | 4.27                                               | 15.04                         | 14.08                                       |
| 7014               | 9.25               | 3.99               | 4.84                                          | 3.52                    | 4.27                                               | 15.96                         | 14.08                                       |
| 7015               | 9.81               | 3.71               | 4.50                                          | 3.52                    | 4.27                                               | 14.84                         | 14.08                                       |
| 7016               | 8.81               | 3.62               | 4.39                                          | 3.52                    | 4.27                                               | 14.48                         | 14.08                                       |
| 7017               | 9.04               | 3.82               | 4.64                                          | 3.52                    | 4.27                                               | 15.28                         | 14.08                                       |
| 7018               | 9.33               | 3.62               | 4.39                                          | 3.52                    | 4.27                                               | 14.48                         | 14.08                                       |
| 7019               | 9.87               | 3.53               | 4.29                                          | 3.52                    | 4.27                                               | 14.12                         | 14.08                                       |
| 7020               | 9.87               | 3.95               | 4.80                                          | 3.52                    | 4.27                                               | 15.80                         | 14.08                                       |
| 7021               | 9.40               | 3.94               | 4.78                                          | 3.52                    | 4.27                                               | 15.76                         | 14.08                                       |
| 7022               | 9.89               | 6.04               | 7.33                                          | 6.18                    | 7.50                                               | 24.16                         | 24.72                                       |
| 7023               | 8.93               | 5.41               | 6.57                                          | 5.00                    | 6.07                                               | 21.64                         | 20.00                                       |
| 7024               | 8.36               | 5.67               | 6.88                                          | 5.00                    | 6.07                                               | 22.68                         | 20.00                                       |
| 7025               | 8.57               | 5.52               | 6.70                                          | 5.00                    | 6.07                                               | 22.08                         | 20.00                                       |
| 7026               | 9.01               | 5.23               | 6.35                                          | 5.00                    | 6.07                                               | 20.92                         | 20.00                                       |
| 7027               | 8.81               | 5.33               | 6.47                                          | 5.00                    | 6.07                                               | 21.32                         | 20.00                                       |
| 7028               | 8.64               | 5.43               | 6.59                                          | 5.00                    | 6.07                                               | 21.72                         | 20.00                                       |
| 7029               | 7.67               | 6.65               | 8.07                                          | 6.18                    | 7.50                                               | 26.60                         | 24.72                                       |
| 7032               | 7.67               | 6.91               | 8.39                                          | 6.18                    | 7.50                                               | 27.64                         | 24.72                                       |
| 7030               | 7.44               | 6.46               | 7.84                                          | 4.95                    | 6.01                                               | 25.84                         | 19.80                                       |
| 7031               | 7.70               | 7.14               | 8.67                                          | 4.95                    | 6.01                                               | 28.56                         | 19.80                                       |
| 7033               | 6.30               | 7.10               | 8.62                                          | 6.18                    | 7.50                                               | 28.40                         | 24.72                                       |
| 6784               | 6.55               | 5.80               | 7.04                                          | 6.20                    | 7.53                                               | 23.20                         | 24.80                                       |



Mississippi Agricultural Experiment Station.

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BULLETIN No. 105.

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INSPECTION AND ANALYSES  
OF COMMERCIAL FERTILIZERS

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI

NOVEMBER, 1907.

MISSISSIPPI FERTILIZER CONTROL.



Inspection and Analyses of Fertilizers

BY THE CHEMICAL DEPARTMENT OF THE

Mississippi Agricultural and Mechanical College.



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INSPECTION AND ANALYSES OF COMMERCIAL FERTILIZERS ON SALE IN THE STATE.

Introduction.—This bulletin constitutes the fourth publication of the Department for the season of 1906-1907. The circulars issued during the busiest months contained analyses as they were made from time to time, and all results are now collected for a general review of the inspection of the past season.

Samples are drawn from practically every point in the State where fertilizers are sold, especial attention being given the more important centers of distribution. Fertilizer inspectors must necessarily exercise the greatest care in taking samples, that they may represent fairly the goods supplied under the various brand names. Reports of analyses are forwarded to dealers as promptly as possible, and copies are sent also to manufacturers at the same time. This procedure probably not infrequently renders possible the somewhat prompt correction of errors and of irregularities in the composition of the raw materials.

It is obviously impracticable, as it is also unnecessary, to make an analysis of every sample received from inspectors, who are kept on the road throughout the busy season. A large number of samples are collected from dealers, and a few also from manufacturers themselves. Selections from these are made with the view of securing an equitable distribution of the analytical work. Samples found below the guaranty of the manufacturer are at once re-analyzed, even in many instances where duplicate determinations were made in the first analysis. All determinations of total phosphoric acid and of nitrogen are made in duplicate.

General results of the inspection.—The number of analyses included in the tables which follow is larger than in any previous publication of the Department. The samples may be classified as follows:

Complete fertilizers (containing nitrogen, phosphoric acid and potash).....	355
Acid phosphates (containing phosphoric acid).....	123
Acid phosphates with potash (containing phosphoric acid and potash).....	9
Ground Bones (containing phosphoric acid—expressed as total)—and nitrogen.....	5
Potash salts.....	14
Total	506

The relative commercial values computed from the analytical results show that 64 samples, or 12.64 per cent., are below the values similarly obtained from the guarantees of the manufacturers. It is probably only fair to point out, however, that in many cases the deficiencies observed are comparatively slight. On the other hand the analyses of a few samples bring to light obvious errors in making up the mixtures. These cases have been dealt with separately, and the dealer or owner has been given the benefit of all the information obtained from a careful examination. Manufacturers of fertilizers cannot secure absolute uniformity of composition in all of the materials at their disposal. Variations must occur, therefore, in practically all mixtures. While the deficiency in one of the constituents may be compensated for in a greater or less degree by a corresponding excess of another, such an adjustment of values is necessarily limited from the standpoint of the farmer whose interest demands, of course, a reasonable conformity to the guaranty on the basis which his purchase is made. The following table is inserted as a comparative statement of the general results of the inspection for the past few years:

	Number of Samples Analyzed.	Number Found Below Guarantee in Relative Value	Percentage Found Below Guarantee in Relative Value.
Season of 1902-1903	262	28	10.68
Season of 1903-1904	280	42	15.00
Season of 1904-1905	399	35	8.77
Season of 1905-1906	437	33	7.55
Season of 1906-1907	506	64	12.64

The above statement, together with the more detailed summary of table II, page 8, may be accepted as an accurate condensed review of the work for the season just closed.

Valuation of fertilizers.—Farmers, dealers and purchasers generally have been reminded very often of the self-evident fact that the value of a ton of fertilizer is measured by the market price of the readily available nitrogen, potash, and phosphoric acid which it contains. The business of the manufacture and sale of fertilizers and fertilizer materials rests on this basis. A purchaser must always ascertain the composition of a ton of fertilizer before he can determine whether he is asked to pay a fair price for it. If he is offered two grades of acid phosphate, for example, one containing 12.50 per cent. available phosphoric acid (250 lbs. to the ton) and the other 16.00 per cent. (320 lbs. to the ton) it is plain that the latter grade is worth 28 per cent. more than the former, weight for weight. If the first grade named is worth \$12.00 per ton, the last is worth at least \$15.36 per ton. It would require 128 pounds of the lower grade to equal in value 100 pounds of the higher, or four 100-lb. bags of the higher grade are about equivalent to five 100-lb. bags of the lower. The price of a gross ton should be kept in the back ground until its actual composition is determined.

To further illustrate this method of comparing values, we will assume that the three grades of fertilizer shown below are made from materials of equal availability and that they are guaranteed to contain:

	GRADE I.		GRADE II.		GRADE III.	
	PER CENT.	LBS. PER TON	PER CENT.	LBS. PER TON	PER CENT.	LBS. PER TON
Water-Sol. Phos. Acid	6.00	120.00	8.00	160.00	4.00	80.00
Citrate-Sol. (reverted Phos. Acid	2.00	40.00	2.00	40.00	2.00	40.00
Nitrogen	1.65	33.00	1.65	33.00	3.00	60.00
Potash	2.00	40.00	2.00	40.00	4.00	80.00
Totals	11.65	233.00	13.65	273.00	13.00	260.00

The **approximate** retail price per pound of the valuable constituents will be found on page 7. We may employ these in computing the relative values of the above mixtures as follows:

	GRADE I.		GRADE II.		GRADE III.	
	POUNDS.	VALUE.	POUNDS.	VALUE.	POUNDS.	VALUE.
Water-Soluble Phos.						
Acid, 6c per lb....	120.00	\$ 7.20	160.00	\$ 9.60	80.00	\$ 4.80
Citrate-Soluble Phos.						
Acid, 5½c per lb.	40.00	2.20	40.00	2.20	40.00	2.20
Nitrogen, 20c per lb...	33.00	6.60	33.00	6.60	60.00	12.00
Potash, 5¼c per lb.	40.00	2.30	40.00	2.30	80.00	4.60
Totals	233.00	\$ 18.30	273.00	\$ 20.70	260.00	\$ 23.60

If grade I is worth \$18.30 a ton, a farmer can easily afford to pay \$20.70 for grade II, and \$23.60 for grade III. If there is a tendency on the part of some farmers and dealers to create a demand for low grade mixtures it is a result of an incorrect idea of economy. It is safe to assume also that the purchase of mixtures carrying only a small amount of nitrogen and potash associated with rather high percentages of soluble and reverted phosphoric acid is not advisable. It is usually better to buy an acid phosphate at once.

Tables of analyses.—Table I presents a general summary of the results of the analyses of samples of goods sold by manufacturers doing business in this State.

Table II contains the analyses of samples drawn by inspectors. These results form a reliable index of the character of the fertilizer supplied under the various brand names.

Table III will show the guaranty of the manufacturer for each brand of fertilizer registered for sale during the season. Analyses of samples (received from manufacturers) representing these brands are also included in this table. All manufacturers and dealers have promptly complied with the provisions of the fertilizer law.

Schedule of values.—The following schedule has been used in computing relative commercial values for the season of 1906-1907. These figures are intended to approximate the relative market values of the constituents of fertilizers. The method of using them in comparing the values of different grades of fertilizer has been explained. The actual cost of fertilizer to the farmer is regulated, of course, by trade conditions; these values have a comparative significance only:

	per lb.	per unit
For Nitrogen.....	20c	\$ 4.00
For Water Soluble Phosphoric Acid in mixed goods....	6c	1.20
For Citrate-Soluble Phosphoric Acid in mixed goods	5½c	1.10
For Water-Soluble Phosphoric Acid in plain Acid Phosphates	5½c	1.10
For Citrate-Soluble Phosphoric Acid in plain Acid Phosphates	5c	1.00
For Total Phosphoric Acid in fine bone	3c	.60
For Total Phosphoric Acid in medium and coarse bone	2½c	.50
For Potash	5¾c	1.15

TABLE I—SUMMARY OF RESULTS IN TABLE II.

NAME AND ADDRESS OF MANUFACTURER.	Number of Samples Analyzed.	Number of Samples equal to or above guarantee in Available Phosphoric Acid Nitrogen, and Potash.	Number of Samples five per cent. below guarantee in Available Phosphoric Acid.	Number of Samples eight per cent below guarantee in Nitrogen.	Number of Samples found as much as eight per cent. below guarantee in Potash.	Number of Samples found as much as three per cent. below guarantee in Relative Commercial Value.	Number of Samples found to be equal to or above guarantee in Relative Commercial Value.
ALABAMA CHEMICAL COMPANY, Montgomery, Ala.	5	3	0	2	0	1	4
AMERICAN GUANO COMPANY, Nashville, Tenn.	1	0	0	0	0	0	1
BIRMINGHAM FERTILIZER COMPANY, Birmingham, Ala.	16	5	0	4	5	0	15
BROOKHAVEN PROGRESSIVE COTTON OIL CO., Brookhaven, Miss.	7	2	1	0	0	1	4
CANTON OIL MILL COMPANY, Canton, Miss.	6	4	0	0	0	2	4
CAPITAL FERTILIZER & M'F'G. CO., Jackson, Miss.	27	18	0	4	1	0	27
CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. CO., Crystal Springs, Miss.	8	6	0	1	0	0	8
EAGLE COTTON OIL COMPANY, Meridian, Miss.	6	6	0	0	0	0	6
FEDERAL CHEMICAL COMPANY, Louisville, Ky.	6	4	1	0	0	1	5
GULFPORT COTTON OIL, FERT. & M'F'G. CO., Gulfport, Miss.	24	16	0	0	2	0	24
HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss.	10	8	0	2	0	0	10
INDEPENDENT OIL & FERT. WORKS, Columbus, Miss.	2	0	0	1	1	0	1
JACKSON FERTILIZER COMPANY, Jackson, Miss.	54	28	0	5	5	0	51
JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.	2	0	0	1	1	0	2
KOSCIUSKO OIL MILL & FERTILIZER CO., Kosciusko, Miss.	9	7	0	0	0	0	9
LAUREL OIL & FERTILIZER CO., Laurel, Miss.	19	11	0	0	0	1	17
LOTTERHOS & HUBER COMPANY, Crystal Springs, Miss.	2	2	0	0	0	0	2

P. B. MATHIASON M'F'G. Co., St. Louis, Mo.	3	0	2	0	2	2	1
MARBACH & EAGAN, Crystal Springs, Miss.	1	1	0	0	0	0	1
MERIDIAN FERTILIZER FACTORY, Meridian, Miss.	92	56	4	9	7	3	82
MISSISSIPPI FERTILIZER COMPANY, Jackson, Miss.	12	7	0	0	0	0	12
MT. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.	6	4	0	0	1	0	3
NEW ORLEANS ACID & FERT. Co., New Orleans, La.	21	9	1	2	3	4	16
NEWTON OIL & M'F'G. Co., Newton, Miss.	10	4	1	3	0	1	9
PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La.	6	2	5	0	2	1	3
REFUGEE COTTON OIL COMPANY, Columbus, Miss.	15	6	5	1	0	3	11
SHUBUTA OIL & M'F'G. Co., Shubuta, Miss.	3	2	0	0	0	0	3
SOUTHERN OIL & FERTILIZER Co., Meridian, Miss.	10	6	1	0	1	2	8
STANDARD GUANO & CHEMICAL M'F'G. Co., New Orleans, La.	26	16	0	3	0	0	23
SWIFT FERTILIZER COMPANY, Atlanta, Ga.	4	0	0	0	2	0	4
TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.	5	2	0	0	1	0	3
TENNESSEE VALLEY FERTILIZER Co., Florence, Ala.	5	1	1	2	2	2	2
THREEFOOT BROS. & Co., Meridian, Miss.	6	0	2	1	2	2	3
TUPELO FERTILIZER FACTORY, Tupelo, Miss.	22	17	0	2	3	0	21
VIRGINIA-CAROLINA CHEMICAL Co., Memphis, Tenn.	53	30	2	4	6	3	45
WESSON COTTON OIL & FERT. Co., Wesson, Miss.	2	2	0	0	0	0	2
Totals	506	285	27	47	47	29	442
Percentages		56.32	5.33	13.35	12.43	5.73	87.35
Totals for Season 1905 - 1906		246	16	66	15	15	404
Percentages for Season 1905 - 1906	437	56.29	3.78	19.64	4.36	3.43	92.45

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
7245	ALABAMA CHEMICAL Co., Montgomery, Ala. H. G. Big Four Acid Phos.....	J. D. Smith & Co., Prentiss..... Guarantee.....
6660	S. G. Liberty Bell Guano.....	J. D. Smith & Co., Prentiss.....
7246	S. G. Liberty Bell Guano.....	O. C. Carr, Pontotoc..... Guarantee.....
6661	S. G. Success Mixture.....	J. D. Smith & Co., Prentiss.....
7247	S. G. Success Mixture.....	J. H. Abney & Co., Pachuta..... Guarantee.....
7248	AMERICAN GUANO Co., Nashville, Tenn. S. G. Mule Brand Blood and Bone.....	McKinney Grocery Co., Iuka..... Guarantee.....
6662	BIRMINGHAM FERT'IZER Co., Birmingham, Ala. Monarch H. G. Acid Phos.....	Florence Merc. Co., Florence.....
7249	Monarch H. G. Acid Phos.....	J. A. Lowe & Co., Nettleton.....
7250	Monarch H. G. Acid Phos.	W. G. Peugh, Aberdeen..... Average Guarantee
7251	B'ham H. G. Fertilizer.....	J. A. Lowe & Co., Nettleton.....
7252	B'ham H. G. Fertilizer.....	Jourdan & Buchannan, Iuka..... Guarantee
7253	B'ham S. G. Fertilizer	W. G. Peugh, Aberdeen..... Guarantee
6663	Monarch S. G. Meal Mixture	J. W. Pickering & Co., Weathersby...
6664	Monarch S. G. Meal Mixture	Hudson & Co., Sumrall.....
6665	Monarch S. G. Meal Mixture	Hicks Merc. Co., Laurel.....
7254	Monarch S. G. Meal Mixture	Florence Merc. Co., Florence.....
7255	Monarch S. G. Meal Mixture	J. A. Lowe & Co., Nettleton.....
7256	Monarch S. G. Meal Mixture	D. F. Holland, Maben.....
7257	Monarch S. G. Meal Mixture	J. Niles Boyd, Kosciusko.....
7258	Monarch S. G. Meal Mixture	J. A. Goree, Columbus.....
7259	Monarch S. G. Meal Mixture	Gaddis & Slay, Magee.....
7260	Monarch S. G. Meal Mixture	Holloway & Worthy, Carson..... Average Guarantee
7261	BROOKHAVEN PROGRESSIVE COTTON OIL Co., Brookhaven, Miss. S. G. Brookhaven Blood and Bone	A. C. Seavey & Sons, Brookhaven..... Guarantee.....
7262	Brookhaven H. G. Special Fertilizer.....	Louis Cohn & Bros., Brookhaven.....
7263	Brookhaven H. G. Special Fertilizer.....	Louis Cohn & Bros., Brookhaven..... Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7245	10.45	9.38 <i>11.00</i>	7.23 <i>5.00</i>	16.61 <i>16.00</i>	.31 <i>1.00</i>			17.55 <i>17.10</i>
6660	8.75	5.23	3.72	8.95	.97	1.51	2.05	18.77
7246	11.84	6.75 <i>6.00</i>	2.55 <i>2.00</i>	9.30 <i>8.00</i>	1.82 <i>2.00</i>	1.69 <i>1.65</i>	2.02 <i>2.00</i>	19.99 <i>18.30</i>
6661	9.77	6.05	3.23	9.28	.52	1.50	1.67	18.73
7247	10.15	6.73 <i>8.00</i>	3.58 <i>1.50</i>	10.31 <i>9.50</i>	.55 <i>2.00</i>	1.81 <i>1.65</i>	1.74 <i>1.50</i>	21.26 <i>19.58</i>
7248	10.70	5.62 <i>6.00</i>	3.51 <i>3.00</i>	9.13 <i>9.00</i>	.82 <i>1.00</i>	1.60 <i>1.65</i>	1.87 <i>1.00</i>	19.16 <i>18.25</i>
6662	12.15	11.26	3.35	14.61	1.43			15.74
7249	13.30	8.88	7.19	16.07	.95			16.96
7250	10.40	7.93	8.26	16.19	2.14			16.98
	11.95	9.36 <i>12.00</i>	6.26 <i>2.00</i>	15.62 <i>14.00</i>	.88 <i>2.00</i>			16.56 <i>15.20</i>
7251	16.03	8.53	3.57	12.10	1.07	1.24	1.21	20.51
7252	13.59	7.85 <i>8.00</i>	3.52 <i>2.00</i>	11.37 <i>10.00</i>	.68 <i>2.00</i>	1.59 <i>1.65</i>	1.73 <i>2.00</i>	21.64 <i>20.70</i>
7253	9.55	5.49 <i>7.50</i>	5.52 <i>2.00</i>	11.01 <i>9.50</i>	1.19 <i>2.00</i>	1.82 <i>1.64</i>	1.60 <i>1.50</i>	21.78 <i>19.49</i>
6663	12.44	8.49	2.86	11.35	1.30	1.47	1.46	20.89
6664	12.44	7.89	2.49	10.38	2.37	1.54	1.34	19.91
6665	12.47	8.05	2.43	10.48	1.73	1.46	1.72	20.15
7254	11.57	7.11	3.82	10.93	1.23	1.64	1.44	20.95
7255	16.27	8.29	2.96	11.25	1.29	1.39	1.00	19.91
7256	13.34	6.63	3.35	9.98	1.15	1.79	1.35	20.35
7257	13.49	7.48	2.99	10.47	1.10	1.60	1.86	20.80
7258	10.23	5.16	4.86	10.02	.91	1.67	1.39	19.82
7259	12.73	7.71	2.93	10.64	1.02	1.52	1.61	20.41
7260	12.60	7.55 12.76	3.20 7.43	10.75 3.19	.81 10.62	1.68 1.58	1.74 1.49	21.30 20.45
		<i>7.50</i>	<i>2.00</i>	<i>9.50</i>	<i>2.00</i>	<i>1.64</i>	<i>1.50</i>	<i>19.49</i>
7261	10.45	5.86 <i>7.00</i>	2.30 <i>1.50</i>	8.16 <i>8.50</i>	.70 <i>1.50</i>	1.68 <i>1.65</i>	1.59 <i>1.60</i>	18.11 <i>18.49</i>
7262	12.21	8.67	1.66	10.33	.14	1.70	2.21	21.57
7263	12.18	6.61 <i>8.00</i>	2.20 <i>2.00</i>	8.81 <i>10.00</i>	.38 <i>1.00</i>	1.69 <i>1.65</i>	2.30 <i>2.00</i>	19.76 <i>20.70</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
6490	S. G. New South.....	J. D. Smith & Co., Prentiss.....
6580	S. G. New South.....	A. C. Seavey & Son, Brookhaven.....
7264	S. G. New South.....	J. D. Smith & Co., Prentiss.....
7265	S. G. New South.....	Louis Cohn & Bros., Brookhaven.....
		Average.....
		Guarantee.....
	CANTON OIL MILL COMPANY, Canton, Miss.	
6655	H. G. Acid Phosphate.....	Canton Oil Mill Co., Canton.....
6777	H. G. Acid Phosphate.....	Barrett Grocery Co., Lexington.....
7266	H. G. Acid Phosphate.....	W. W. Coulter, Canton.....
		Average.....
		Guarantee.....
6656	S. G. Paragon.....	Canton Oil Mill Co., Canton.....
6778	S. G. Paragon.....	Barrett Grocery Co., Lexington.....
7267	S. G. Paragon.....	W. W. Coulter, Canton.....
		Average.....
		Guarantee.....
	CAPITAL FERT. & M'F'G. Co., Jackson, Miss.	
6380	H. G. Acid Phosphate.....	J. D. Ray, Kosciusko.....
7268	H. G. Acid Phosphate.....	Peets & Norman Co., Hazlehurst.....
7269	H. G. Acid Phosphate.....	Miss. Cotton Oil Co., Grenada.....
		Average.....
		Guarantee.....
6581	S. G. Acid Phosphate.....	Hyman Merc. Co., Summit.....
6330	S. G. Acid Phosphate.....	R. A. Howard, Morton.....
6666	S. G. Acid Phosphate.....	D'Lo Merc. Co., D'Lo.....
7270	S. G. Acid Phosphate.....	Knox McNair, Star.....
		Average.....
		Guarantee.....
6331	S. G. Cotton Elevator.....	L. H. Ginn, Tylertown.....
6667	S. G. Cotton Elevator.....	J. D. Ray, Kosciusko.....
7271	S. G. Cotton Elevator.....	Miss. Cotton Oil Co., West Point.....
		Average.....
		Guarantee.....
6299	S. G. Nonpariel.....	Capital Fert. & M'f'g. Co., Jackson.....
6332	S. G. Nonpariel.....	Adams & Pigott, Tylertown.....
6381	S. G. Nonpariel.....	J. D. Ray, Kosciusko.....
6582	S. G. Nonpariel.....	J. L. Moyse & Bro., Summit.....
6668	S. G. Nonpariel.....	J. P. Cox & Son, Braxton.....
6769	S. G. Nonpariel.....	Peets & Norman Co., Hazlehurst.....
7272	S. G. Nonpariel.....	W. C. Ellis, Florence.....
7273	S. G. Nonpariel.....	W. H. Gallaspy's Sons Co., Hickory.....
7274	S. G. Nonpariel.....	Watts Merc. Co., Sandersville.....
7275	S. G. Nonpariel.....	Gallaspy Bros., Union.....
7276	S. G. Nonpariel.....	G. G. Holloway, Carson.....
		Average.....
		Guarantee.....
6333	S. G. Red Star Brand.....	C. Alcus, Summit.....
6334	S. G. Red Star Brand.....	Roby Allen, Kosciusko.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6450	10.68	5.73	3.41	9.14	.31	1.59	2.15	19.46
6580	10.25	5.71	3.78	9.49	.43	1.59	2.12	19.81
7264	10.64	5.80	3.70	9.50	.33	1.57	2.14	19.77
7265	11.64	6.64	2.51	9.15	.23	1.75	2.26	20.33
	10.81	5.97	3.35	9.32	.32	1.63	2.17	19.84
		7.00	2.00	9.00	1.00	1.65	2.00	19.50
6655	11.37	4.99	9.97	14.96	.69			15.46
6777	12.45	8.92	5.53	14.45	.42			15.34
7266	12.55	11.45	3.89	15.34	.31			16.49
	12.12	8.45	6.46	14.91	.47			15.76
		11.00	4.00	15.00	1.00			16.10
6656	9.16	5.97	4.07	10.04	.33	2.28	.68	21.54
6778	9.72	6.01	4.09	10.10	.45	2.14	.63	21.00
7267	10.94	7.02	3.01	10.03	.59	2.42	.67	22.19
	9.94	6.33	3.72	10.05	.46	2.28	.66	21.57
		6.60	2.90	9.50	1.05	2.00	.25	19.40
6380	13.00	9.47	4.76	14.23	.05			15.18
7268	13.08	11.86	3.11	14.97	.13			16.16
7269	11.90	10.57	4.33	14.90	.32			15.96
	12.66	10.63	4.07	14.70	.17			15.76
		10.00	4.00	14.00	1.00			15.00
6581	11.95	9.59	5.23	14.82	.20			15.78
6330	13.10	10.12	5.27	15.39	.25			16.40
6666	11.52	9.56	4.62	14.18	.36			15.14
7270	11.93	10.07	3.74	13.81	.09			14.82
	12.13	9.83	4.72	14.55	.22			15.53
		10.00	2.00	12.00	1.00			13.00
6331	12.44	5.69	3.33	9.02	1.09	1.74	2.46	20.28
6667	12.91	6.72	3.91	10.63	.18	1.50	2.33	21.04
7271	11.76	6.27	3.36	9.63	.29	1.50	2.05	19.58
	12.37	6.23	3.53	9.76	.52	1.58	2.28	20.30
		6.50	1.50	8.00	1.00	1.65	2.00	18.35
6299	12.38	5.88	2.92	8.80	1.02	1.43	2.38	18.73
6332	12.78	7.68	2.09	9.77	1.54	1.74	2.40	21.24
6381	13.05	6.88	3.54	10.42	.14	1.63	2.32	21.34
6582	10.87	6.37	3.57	9.94	.18	1.69	2.17	20.83
6668	11.69	6.45	2.41	8.86	.81	1.78	2.13	19.96
6769	11.18	7.19	1.74	8.93	.20	1.76	2.57	20.54
7272	11.32	6.05	2.17	8.22	.36	1.72	2.57	19.48
7273	11.44	7.19	2.09	9.28	.27	1.74	2.27	20.50
7274	11.04	7.07	1.72	8.79	.06	1.84	2.52	20.63
7275	11.47	7.14	1.64	8.78	.35	1.68	2.16	19.58
7276	10.94	7.38	1.55	8.93	.05	1.79	2.25	20.31
	11.65	6.84	2.31	9.15	.45	1.71	2.34	20.28
		6.50	1.50	8.00	1.00	1.65	2.00	18.35
6333	13.07	7.21	3.57	10.78	.30	1.54	2.13	21.19
6334	13.65	7.50	3.50	11.00	.39	1.41	2.00	20.79

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
6382	S. G. Red Star Brand.....	J. D. Ray, Kosciusko.....
7277	S. G. Red Star Brand.....	R. E. Johnson, Canton.....
		Average.....
		Guarantee.....
7278	H. G. Vegetable Grower.....	Peets & Norman Co., Hazlehurst.....
7279	H. G. Vegetable Grower.....	J. D. Ray, Kosciusko.....
		Guarantee.....
	CRYSTAL SPRINGS OIL MILL, FERTILIZER & M'FG. Co., Crystal Springs, Miss.	
6583	S. G. Crystal Star.....	Lotterhos & Huber Co., Crystal Springs
7280	S. G. Crystal Star.....	Lotterhos & Huber Co., Crystal Springs
		Guarantee.....
6584	S. G. L. & H. Co.'s Cotton Fertilizer.....	Lotterhos & Huber Co., Crystal Springs
7281	S. G. L. & H. Co.'s Cotton Fertilizer.....	Lotterhos & Huber Co., Crystal Springs
		Guarantee.....
6586	H. G. L. & H. Co.'s Special Fertilizer.....	Lotterhos & Huber Co., Crystal Springs
7282	H. G. L. & H. Co.'s Special Fertilizer.....	Lotterhos & Huber Co., Crystal Springs
		Guarantee.....
6585	H. G. L. & H. Co.'s Veg. Grower	Lotterhos & Huber Co., Crystal Springs
		Guarantee.....
6587	S. G. German Kainit	Lotterhos & Huber Co., Crystal Springs
		Guarantee.....
	EAGLE COTTON OIL COMPANY, Meridian, Miss.	
6588	Eagle H. G. Acid Phosphate	C. T. Bonner, Enterprise.....
7283	Eagle H. G. Acid Phosphate	J. L. Grace, Macon.....
		Guarantee.....
6589	S. G. Farm Mixture.....	C. T. Bonner, Enterprise.....
7284	S. G. Farm Mixture.....	Davis & Bufkin, Buckatunna.....
		Guarantee.....
6590	S. G. German Kainit	C. T. Bonner, Enterprise.....
7285	S. G. German Kainit	Forest Ginning & M'fg. Co., Forest...
		Guarantee.....
	FEDERAL CHEMICAL Co., Louisville, Ky. MARKS & GAYLE, Div. M'grs., Montgomery, Ala.	
6669	Daybreak Prue H. G. Acid Phosphate...	L. L. Price, Toomsaba.....
7286	Daybreak Pure H. G. Acid Phosphate.....	J. K. Kirkland, Quitman.....
7287	Daybreak Pure H. G. Acid Phosphate.....	J. A. Goree, Columbus.....
		Average.....
		Guarantee.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6382	13.50	6.95	3.88	10.83	.14	1.62	2.10	21.50
7277	11.35	6.68	2.27	8.97	.15	1.87	3.76	22.32
	12.89	7.08	3.31	10.39	.24	1.61	2.50	21.45
		<i>6.50</i>	<i>1.50</i>	<i>8.00</i>	<i>1.00</i>	<i>1.65</i>	<i>2.00</i>	<i>18.35</i>
7278	10.57	5.46	2.15	7.61	.15	2.33	4.46	23.37
7279	9.88	5.69	1.93	7.62	.10	2.66	3.16	23.23
		<i>5.00</i>	<i>2.00</i>	<i>7.00</i>	<i>1.00</i>	<i>2.50</i>	<i>4.00</i>	<i>22.80</i>
6583	9.55	5.64	3.08	8.72	.51	1.96	3.08	21.54
7280	11.14	5.68	2.98	8.66	.65	1.84	2.71	20.57
		<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>.75</i>	<i>1.70</i>	<i>2.00</i>	<i>18.45</i>
6584	10.23	5.58	3.23	8.81	.61	1.83	3.27	21.33
7281	12.19	5.85	3.17	9.02	.65	1.86	2.24	20.52
		<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>.75</i>	<i>1.70</i>	<i>2.00</i>	<i>18.45</i>
6586	10.83	5.21	2.09	7.30	.38	1.65	5.47	21.44
7282	11.07	4.30	2.57	6.87	.47	1.93	4.93	21.38
		<i>4.50</i>	<i>2.00</i>	<i>6.50</i>	<i>.30</i>	<i>1.90</i>	<i>4.50</i>	<i>20.38</i>
6585	9.50	4.32	3.13	7.45	.33	2.97	4.43	25.60
		<i>4.00</i>	<i>1.50</i>	<i>5.50</i>	<i>.25</i>	<i>3.00</i>	<i>4.00</i>	<i>23.05</i>
6587	2.07						12.32	14.17
							<i>12.00</i>	<i>13.80</i>
6588	8.29	9.02	6.26	15.28	.58			16.18
7283	9.18	8.62	6.63	15.25	.63			16.11
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>1.00</i>			<i>15.00</i>
6599	10.07	6.65	3.38	10.03	.37	1.81	2.43	21.73
7284	10.53	6.90	3.06	9.96	.36	1.73	2.38	21.30
		<i>6.00</i>	<i>2.00</i>	<i>8.00</i>	<i>.50</i>	<i>1.65</i>	<i>2.00</i>	<i>18.30</i>
6590	2.06						13.50	15.53
7285	2.21						12.94	14.88
							<i>12.00</i>	<i>13.80</i>
6669	14.38	11.21	3.76	14.97	.81			16.09
7286	9.73	9.04	6.89	15.93	4.46			16.83
7287	10.59	9.25	5.74	14.99	1.59			15.92
	11.57	9.83	5.46	15.29	2.28			16.28
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>1.00</i>			<i>15.00</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
6670	S. G. Daybreak Fertilizer.....	L. L. Price, Toomsuba.....
7288	S. G. Daybreak Fertilizer.....	Rumble & Wensel, Natchez.....
7289	S. G. Daybreak Fertilizer.....	Jack Gaston, Ackerman.....
		Average.....
		Guarantee.....
	GULFPORT COTTON OIL, FERT. & M'FG. Co., Gulfport, Miss.	
6591	Primo H. G. Acid Phosphate.....	Guy Northrop, Pass Christian.....
7290	Primo H. G. Acid Phosphate.....	T. S. Turner, Canton.....
		Guarantee.....
6671	Primo S. G. Acid Phosphate.....	Donald Bros. Merc. Co., New Hebron
7291	Primo S. G. Acid Phosphate.....	F. E. Shivers, D'Lo.....
7292	Primo S. G. Acid Phosphate.....	J. W. Kervin, Collins.....
7293	Primo S. G. Acid Phosphate.....	J. M. Graham, Seminary.....
7294	Primo S. G. Acid Phosphate.....	Summit Merc. Co., Summit.....
		Average.....
		Guarantee.....
6672	Primo S. G. Acid Phosphate and Potash	F. E. Shivers, D'Lo.....
		Guarantee.....
6491	Primo H. G. Blood & Bone	Gulfport Cotton Oil, Fert. & M'fg. Co., Columbia.....
6673	Primo H. G. Blood & Bone	Gulfport Cotton Oil, Fert. & M'fg. Co., Columbia.....
7295	Primo H. G. Blood & Bone	M. C. Helfin, Mendenhall.....
7296	Primo H. G. Blood & Bone	J. L. Moyse & Bro., Summit.....
		Average.....
		Guarantee.....
6492	Primo S. G. Cottonseed Meal Compound.....	Gulfport Cotton Oil, Fertilizer & M'fg. Co., Columbia.....
6674	Primo S. G. Cottonseed Meal Compound.....	W. A. Holloway, Mt. Olive.....
6675	Primo S. G. Cottonseed Meal Compound.....	T. S. Turner, Canton.....
7297	Primo S. G. Cottonseed Meal Compound.....	Donald Bros. Merc. Co., New Hebron
7298	Primo S. G. Cottonseed Meal Compound.....	Walker Bros., Taylorsville.....
7299	Primo S. G. Cottonseed Meal Compound.....	D. J. Richey, Enterprise.....
		Average.....
		Guarantee.....
6676	Primo S. G. R. B. Super- Phosphate.....	J. L. Wilson, Braxton.....
7300	Primo S. G. R. B. Super- phosphate.....	Harrison Nelson Co., Magee.....
7301	Primo S. G. R. B. Super- phosphate	W. A. Holloway, Mt. Olive.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6670	7.44	4.61	2.75	7.36	.99	1.56	2.04	17.14
7288	13.06	5.08	2.85	7.93	2.10	1.83	2.00	18.85
7289	11.51	4.45	4.30	8.75	2.97	1.79	2.04	19.58
	10.67	4.71	3.30	8.01	2.02	1.72	2.03	18.52
		5.33	2.67	8.00	1.00	1.65	2.00	18.23
6591	12.05	12.51	4.71	17.22	.47			18.47
7290	13.25	12.24	3.27	15.51	.56			16.73
		12.00	2.00	14.00	1.00			15.20
6671	12.61	10.90	3.52	14.42	.63			15.51
7291	10.89	9.53	5.66	15.19	1.27			16.14
7292	13.32	10.18	3.03	13.21	1.46			14.23
7293	13.51	10.78	3.42	14.20	1.54			15.28
7294	14.00	9.70	3.86	13.56	1.06			14.53
	12.86	10.22	3.89	14.11	1.19			15.13
		10.00	2.00	12.00	1.00			13.00
6672	11.75	8.80	3.32	12.12	.37		2.68	17.29
		8.00	2.00	10.00	1.50		2.00	14.10
6491	12.43	7.78	.58	10.36	.55	1.58	2.60	21.48
6673	11.78	7.77	2.51	10.28	.54	1.80	2.54	22.21
7295	11.91	8.12	3.32	11.44	.91	1.53	1.74	21.52
7296	12.08	7.76	2.12	9.88	.32	2.22	2.05	22.88
	12.05	7.86	2.63	10.49	.58	1.78	2.23	22.02
		8.00	2.00	10.00	1.00	1.65	2.00	20.70
6492	12.84	6.13	2.49	8.62	.56	2.08	2.06	20.78
6674	14.23	5.90	4.58	10.48	1.04	1.83	1.35	20.99
6675	11.53	7.78	2.54	10.32	.32	1.83	2.73	22.59
7297	12.54	6.84	2.34	9.18	.49	1.99	2.26	21.34
7298	11.58	6.98	1.94	8.92	.42	1.90	2.30	20.76
7299	11.22	7.36	1.64	9.00	.47	2.02	2.31	21.37
	12.32	6.83	2.59	9.42	.55	1.94	2.17	21.30
		7.00	2.00	9.00	1.00	1.65	2.00	19.50
6676	9.36	6.59	3.66	10.25	1.71	2.04	2.37	22.82
7300	11.32	6.72	2.65	9.37	.87	2.08	2.18	21.81
7301	10.71	5.88	2.78	8.66	1.19	1.91	2.32	20.42

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7302	Primo S. G. R. B. Super-phosphate	A. K. Kennedy, Weathersby.....
7303	Primo S. G. R. B. Super-phosphate	W. J. Carter, Bassfield..... Average..... Guarantee.....
7304	Primo H. G. Raw Ground Bone	Gulfport Cotton Oil, Fert. & M'f'g. Co., Columbia..... Guarantee.....
	HAZLEHURST OIL MILL & FERTILIZER Co., Hazlehurst, Miss.	
7305	H. G. Acid Phosphate.....	J. R. Gillaspy, Crystal Springs..... Guarantee.....
6363	S. G. Imperial Fertilizer.....	Hazlehurst Oil Mill & Fert. Co., H'hurst...
6592	S. G. Imperial Fertilizer.....	Wise Merc. Co., Hazlehurst.....
7306	S. G. Imperial Fertilizer.....	Hyman Merc. Co., Summit.....
7307	S. G. Imperial Fertilizer.....	Givens Bros., McDuffy Co., Monticello.....
7308	S. G. Imperial Fertilizer.....	J. R. Gillaspy, Crystal Springs.....
7309	S. G. Imperial Fertilizer.....	Parsons, May, Oberschmidt Co., Brookhaven.....
7310	S. G. Imperial Fertilizer.....	Grenada Oil Mill, Grenada.....
7311	S. G. Imperial Fertilizer.....	Hyman Merc. Co., Summit.....
7312	S. G. Imperial Fertilizer.....	J. R. Gillaspy, Crystal Springs..... Average..... Guarantee.....
.	INDEPENDENT OIL & FERT. WORKS, Columbus, Miss.	
6677	Independent H. G. All Lint Fertilizer.....	J. W. Jenkins, Shuqualak.....
7313	Independent H. G. All Lint Fertilizer.....	W. T. Cole, Steenston..... Guarantee.....
	JACKSON FERTILIZER Co., Jackson, Miss.	
7314	S. G. Black Hawk Acid Phosphate.....	Gaddis & Slay, Magee.....
7315	S. G. Black Hawk Acid Phosphate.....	R. F. Everett, Braxton.....
7316	S. G. Black Hawk Acid Phosphate.....	J. A. Taylor & Son, Pelahatchie..... Average..... Guarantee.....
6335	H. G. Acid Phosphate.....	Moore Bros., Morton.....
6493	H. G. Acid Phosphate.....	Rawls Lampton & Co., Silver Creek ...
6678	H. G. Acid Phosphate.....	C. W. Alexander, Montrose.....
6679	H. G. Acid Phosphate.....	The Fair Company, Louisville.....
7317	H. G. Acid Phosphate.....	F. L. Riley Merc. Co., New Hebron...
7318	H. G. Acid Phosphate.....	Barney, Johns & Co., Gloster

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7302	9.99	6.52	2.87	9.39	1.29	1.83	2.22	20.85
7303	13.02	6.88	2.83	9.71	.69	1.57	2.11	20.08
	10.88	6.52	2.94	9.48	1.15	1.88	2.24	21.19
		7.00	2.00	9.00	1.00	1.65	2.00	19.50
7304	5.08				24.29	3.21		24.99
					20.00	3.00		22.00
7305	12.75	10.63	4.80	15.43	1.37			16.49
		12.00	2.00	14.00	1.00			15.20
6363	11.05	8.03	3.17	11.20	.70	1.41	2.06	21.13
6592	12.84	6.78	.78	9.56	.50	1.68	2.90	21.25
7306	12.25	7.24	2.30	9.54	.52	1.74	2.16	20.66
7307	10.87	7.36	3.31	10.67	.72	1.65	2.14	21.53
7308	12.71	7.19	3.01	10.21	1.04	1.82	1.96	21.47
7309	10.96	7.41	2.89	10.30	.42	1.69	2.21	21.37
7310	12.46	7.79	2.86	10.65	1.11	1.70	2.14	21.76
7311	13.24	8.29	2.30	10.59	.81	1.50	2.04	20.82
7312	13.10	7.30	3.02	10.32	.82	1.93	1.87	21.95
	12.16	7.48	2.85	10.33	.74	1.68	2.16	21.32
		7.50	2.00	9.50	1.00	1.65	1.75	19.81
6677	11.42	7.57	3.18	10.75	.70	2.13	1.58	22.92
7313	14.43	6.90	3.70	10.60	1.11	1.42	2.14	20.49
		8.00	2.00	10.00	1.00	1.65	2.00	20.70
7314	11.44	9.43	2.85	12.28	2.88			13.22
7315	14.89	8.84	6.53	15.37	.93			16.25
7316	14.34	8.94	5.08	14.02	1.50			14.90
	13.56	9.07	4.82	13.89	1.77			14.79
		10.00	2.00	12.00	1.00			13.00
6335	14.60	11.97	3.57	15.54	1.78			16.74
6493	15.30	10.68	4.34	15.02	1.36			16.09
6678	13.81	10.25	4.17	14.42	2.11			15.45
6679	13.45	11.09	3.45	14.54	2.23			15.65
7317	16.29	11.42	3.60	15.02	1.61			16.16
7318	17.34	10.94	3.58	14.52	1.56			15.61

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7319	H. G. Acid Phosphate.....	Centreville Merc. Co., Centreville.....
7320	H. G. Acid Phosphate.....	J. A. Spann, Pelahatchie.....
7321	H. G. Acid Phosphate.....	Guss Baine & Co., Ackerman.....
7322	H. G. Acid Phosphate.....	O. W. Conner & Co., Seminary.....
		Average.....
		Guarantee.....
6593	S. G. Chicago R. B. Superphosphate	Lotterhos & Huber Co., Crystal Springs.....
6680	S. G. Chicago R. B. Superphosphate	O. W. Conner & Co., Seminary.....
7323	S. G. Chicago R. B. Superphosphate	Holmes Bros., McComb City.....
7324	S. G. Chicago R. B. Superphosphate	Johnson-Woodward Co., Mt. Olive.....
		Average.....
		Guarantee.....
6364	S. G. Lampton's Am. R. B. Superphosphate	Lotterhos & Huber., Crystal Springs.....
6494	S. G. Lampton's Am. R. B. Superphosphate	The Lampton Co., Columbia.....
7325	S. G. Lampton's Am. R. B. Superphosphate	Lampton Merc. Co., Magnolia.....
7326	S. G. Lampton's Am. R. B. Superphosphate	Lotterhos & Huber Co., Crystal Springs.....
		Average.....
		Guarantee.....
6300	S. G. Royal "C" Brand	Henderson, & Molphus Co., Philadelphia.....
6336	S. G. Royal "C" Brand	Moore Bros., Morton.....
6337	S. G. Royal "C" Brand	Storey & Company, Forest.....
6365	S. G. Royal "C" Brand	The Lampton Bros. & Co., Tylertown.....
6366	S. G. Royal "C" Brand	The Lampton Company, Columbia.....
6367	S. G. Royal "C" Brand	Lampton & Rawls Co., Mt. Olive.....
6495	S. G. Royal "C" Brand	S. S. Dale & Sons, Prentiss.....
6496	S. G. Royal "C" Brand	Rawls, Lampton & Co., Silver Creek.....
6594	S. G. Royal "C" Brand	C. Atkinson's Sons Co., Summit.....
6618	S. G. Royal "C" Brand	The Lampton Merc. Co., Magnolia.....
6681	S. G. Royal "C" Brand	Abney & Travis, Heidelberg.....
6682	S. G. Royal "C" Brand	Walker-Durr Co., Pinola.....
6683	S. G. Royal "C" Brand	F. L. Riley Merc. Co., New Hebron.....
6684	S. G. Royal "C" Brand	The Lampton Co., Columbia.....
7328	S. G. Royal "C" Brand	J. P. Meyer, Ellisville.....
7329	S. G. Royal "C" Brand	Morris H. Rothechild, Woodville.....
7330	S. G. Royal "C" Brand	S. Hirsch, Fayette.....
7331	S. G. Royal "C" Brand	W. M. Carstarphen, Bolton.....
7332	S. G. Royal "C" Brand	Moreton-Wentworth Co., Brookhaven.....
7333	S. G. Royal "C" Brand	Blackston Merc. Co., Winona.....
7334	S. G. Royal "C" Brand	Lotterhos & Huber Co., Crystal Springs.....
7335	S. G. Royal "C" Brand	Hickman Son, Butler & Co., Monticello.....
7336	S. G. Royal "C" Brand	Centreville Merc. Co., Centreville.....
7337	S. G. Royal "C" Brand	Davis & Bufkin, Buckatunna.....
7338	S. G. Royal "C" Brand	G. M. Gallaspy, Decatur.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7319	16.91	9.93	4.77	14.70	1.50			15.69
7320	14.98	9.74	4.30	14.04	2.44			15.01
7321	15.19	9.90	3.73	13.63	2.64			14.62
7322	13.72	10.46	4.85	15.31	1.88			16.36
	15.16	10.64	4.03	14.67	1.91			15.73
		12.00	2.00	14.00	1.00			15.20
6593	10.93	6.91	4.39	11.30	2.20	1.52	1.69	21.14
6680	11.99	6.37	3.88	10.25	2.99	1.63	1.37	20.01
7323	10.01	5.37	5.73	11.10	.83	1.60	1.14	20.46
7324	8.70	5.12	4.55	9.67	3.75	2.11	1.64	21.48
	10.41	5.94	4.64	10.58	2.19	1.72	1.46	20.78
		7.50	2.00	9.50	1.00	1.65	1.50	19.53
6364	9.82	6.96	2.49	9.45	.47	3.36	1.81	26.61
6494	7.95	6.55	4.04	10.59	3.11	1.77	1.53	21.14
7325	9.66	5.76	4.68	10.44	3.08	1.69	1.56	20.61
7326	11.19	5.87	3.36	9.23	.48	3.97	1.76	28.64
	9.66	6.28	3.61	9.92	1.78	2.95	1.66	24.25
		7.50	2.00	9.50	1.00	1.65	1.80	19.87
6300	11.27	7.16	4.74	11.90	.41	1.73	1.93	22.95
6336	11.94	7.10	2.91	10.01	.93	1.62	2.14	20.66
6337	11.65	7.60	3.07	10.67	.96	1.52	2.08	20.97
6365	11.22	8.57	2.77	11.34	.63	1.39	1.85	21.02
6366	13.80	7.39	3.22	10.61	.64	1.54	2.15	21.04
6367	14.75	6.84	3.52	10.36	1.01	1.53	2.01	20.51
6495	12.95	7.22	3.29	10.51	1.25	1.37	2.08	20.16
6496	13.10	7.69	3.00	10.69	.72	1.42	2.06	20.58
6594	10.84	6.86	3.58	10.44	.91	1.74	2.03	21.58
6618	12.96	7.64	2.93	10.57	.74	1.57	2.10	21.09
6681	11.92	7.34	2.35	9.69	.93	1.78	.17	21.01
6682	12.41	7.10	4.08	11.18	.05	1.70	2.41	22.58
6683	11.92	7.42	3.88	11.30	.70	1.68	2.39	22.64
6684	12.84	7.22	3.92	11.14	.06	1.63	2.24	22.07
7328	13.34	7.77	3.14	10.91	1.39	1.59	1.99	21.43
7329	12.76	7.94	2.70	10.64	1.32	1.65	2.02	21.42
7330	12.85	7.51	3.37	10.88	1.13	1.67	1.98	21.68
7331	13.45	7.65	3.24	10.89	1.19	1.63	1.72	21.24
7332	13.34	7.82	2.88	10.70	1.55	1.69	1.58	21.13
7333	14.09	6.40	2.88	9.28	1.47	1.62	2.07	19.71
7334	11.18	6.12	3.52	9.64	1.41	1.76	2.12	20.69
7335	12.61	7.11	2.63	9.74	1.30	1.62	2.02	20.23
7336	12.18	6.91	3.38	10.29	.90	1.82	1.97	21.56
7337	12.24	7.39	3.34	10.73	.83	1.63	1.93	21.28
7338	13.33	7.29	3.08	10.37	.68	1.53	2.11	20.68

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7339	S. G. Royal "C" Brand	Crawford & Coleman, Noxapater.....
7340	S. G. Royal "C" Brand	The Fair Company, Louisville.....
7341	S. G. Royal "C" Brand	Holmes Bros., McComb City.....
7342	S. G. Royal "C" Brand	J. P. Meyer Merc. Co., Taylorsville...
7343	S. G. Royal "C" Brand	Gus Baine & Co., Ackerman.....
7344	S. G. Royal "C" Brand	S. S. Dale & Sons, Prentiss.....
		Average.....
		Guarantee.....
7345	S. G. German Kainit.....	Gaddis & Slay, Magee.....
7346	S. G. German Kainit.....	F. L. Riley Merc. Co., New Hebron...
		Guarantee.....
	JEFFERSON FERTILIZER Co., Birmingham, Ala.	
6779	S. G. Warrior Ammoniated Potash.....	Vaughn & Harris, Steenston.....
		Guarantee.....
6780	H. G. Warrior Meal, Acid and Potash Mixture	Vaughn & Harris, Steenston.....
		Guarantee.....
	KOSCIUSKO OIL MILL & FERT. COMPANY, Kosciusko, Miss.	
6383	H. G. Acid Phosphate.....	G. Lowenberg & Co., Kosciusko.....
6384	H. G. Acid Phosphate.....	W. B. Potts & Sons, Kosciusko.....
7347	H. G. Acid Phosphate.....	Bennett Bros. & McMillin, Louisville
7348	H. G. Acid Phosphate.....	R. W. Kelly, Kosciusko.....
		Average.....
		Guarantee.....
6385	S. G. Peerless Guano.....	W. B. Potts & Sons, Kosciusko.....
6685	S. G. Peerless Guano.....	J. B. Triplett, McCool.....
7349	S. G. Peerless Guano.....	G. Lowenberg & Co., Kosciusko.....
7350	S. G. Peerless Guano.....	O. L. Shaw, Ackerman.....
7351	S. G. Peerless Guano.....	W. B. Potts & Sons, Kosciusko.....
		Average.....
		Guarantee.....
	LAUREL OIL & FERT. Co., Laurel, Miss.	
6301	S. G. Acid Phosphate	J. T. Wilson, Philadelphia.....
6497	S. G. Acid Phosphate	Laurel Oil & Fert. Co., Laurel.....
6686	S. G. Acid Phosphate	D. C. Griffith & Co., Silver Creek.....
6687	S. G. Acid Phosphate	W. T. Day, Mt. Olive.....
		Average.....
		Guarantee.....
7352	H. G. Acid Phosphate.....	F. O. Horn & Co., Union
7353	H. G. Acid Phosphate.....	J. H. McGowan, Pachuta.....
		Guarantee.....
6688	S. G. K. C. Ammoniated Bone	J. D. Burnett, Bay Springs.....
6689	S. G. K. C. Ammoniated Bone	R. F. Waldon & Co., Prentiss.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7339	12.58	8.55	1.38	9.93	.92	1.63	1.94	20.53
7340	13.40	7.68	2.68	10.36	1.98	1.83	2.16	21.97
7341	12.38	7.38	2.87	10.25	.67	1.73	2.23	21.50
7342	12.85	6.86	2.82	9.68	1.11	1.64	2.02	20.22
7343	13.21	7.13	3.30	10.43	.70	1.65	2.17	21.28
7344	12.59	6.78	2.80	9.58	1.54	1.57	2.01	19.81
	12.63	7.34	3.13	10.47	.96	1.63	2.06	21.14
		7.50	2.00	9.50	1.00	1.65	1.80	19.87
7345	3.00						13.16	15.13
7346	1.59						13.28	15.27
							12.00	13.80
6779	11.60	6.78	4.30	11.09	2.38	.73	.78	16.68
		7.00	3.00	10.00	2.00	.82	1.00	16.13
6780	12.27	7.06	2.85	9.91	2.06	1.72	2.56	21.43
		7.00	3.00	10.00	2.00	1.65	2.00	20.60
6383	13.05	10.98	3.84	14.82	.60			15.92
6384	14.42	10.80	3.63	14.48	.74			15.51
7347	17.12	9.89	5.03	14.92	1.05			15.91
7348	14.59	13.24	4.35	17.59	.59			18.91
	14.80	11.23	4.21	15.45	.74			16.56
		11.00	3.00	14.00	1.00			15.10
6385	10.75	7.80	3.52	11.32	.17	1.63	2.11	22.18
6685	11.59	7.34	3.48	10.82	.70	1.65	2.52	22.13
7349	11.84	7.20	3.28	10.48	.54	1.89	2.19	22.33
7350	11.69	7.15	3.54	10.69	.69	1.79	2.14	22.02
7351	12.29	7.01	3.14	10.15	.97	1.79	2.11	21.45
	11.63	7.30	3.39	10.69	.61	1.75	2.21	22.03
		8.00	1.50	9.50	1.00	1.67	1.75	19.94
6301	14.45	10.29	3.43	13.72	1.34			14.75
6497	14.79	9.63	3.66	13.29	1.89			14.25
6686	12.85	10.87	2.97	13.84	2.84			14.93
6687	14.80	10.22	3.47	13.69	1.32			14.71
	14.22	10.25	3.38	13.63	1.85			14.66
		10.00	2.00	12.00	3.00			13.00
7352	15.78	9.03	4.31	13.34	1.33			14.24
7353	16.23	9.15	4.73	13.88	1.20			14.80
		12.00	2.00	14.00	2.00			15.20
6688	14.19	7.20	3.50	10.70	1.04	.98	2.55	19.34
6689	12.20	7.30	3.52	10.82	.95	1.00	2.27	19.24

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7354	S. G. K. C. Ammoniated Bone	J. H. McGowan, Pachuta.....
7355	S. G. K. C. Ammoniated Bone	H. H. Overstreet, Eastabutchie..... Average..... Guarantee.....
6302	S. G. Plow Brand	Stewart Donald & Son, Philadelphia.....
6368	S. G. Plow Brand	Taylorsville Gin & Warehouse Co., Taylorsville.....
6498	S. G. Plow Brand	Laurel Oil & Fertilizer Co., Laurel.....
6595	S. G. Plow Brand	W. W. Pigford, Lumberton.....
6690	S. G. Plow Brand	Williams & Freeman, Sandersville.....
6691	S. G. Plow Brand	Dorsett & Co., Richton.....
7356	S. G. Plow Brand	R. F. Walden & Co., Prentiss.....
7357	S. G. Plow Brand	Hosey & Williams, Sandersville.....
7358	S. G. Plow Brand	Croom and Story, Lucedale..... Average..... Guarantee.....
	LOTTERHOS & HUBER Co., Crystal Springs, Miss.	
7127	Castor Pomace.....	Lotterhos & Huber Co., Crystal Springs
7359	Castor Pomace.....	Lotterhos & Huber Co., Crystal Springs Guarantee.....
	P. B. MATHIASON M'F'G. Co., St. Louis, Mo.	
7360	H. G. Increscent Brand Dissolved Bone	A. M. Seabrook, State Line.....
7361	H. G. Increscent Brand Dissolved Bone	G. R. Oliphant, Enterprise.....
7585	H. G. Increscent Brand Dissolved Bone	A. B. Smith, Moselle..... Average..... Guarantee.....
	MARBACH & EAGAN, Crystal Springs, Miss.	
7362	H. G. Bat Guano.....	Lotterhos & Huber Co., Crystal Springs Guarantee.....
	MERIDIAN FERT. FACTORY, Meridian, Miss.	
6338	H. G. Meridian Southern Acid Phosphate	Smythe Gaddis & Co., Forest.....
6339	H. G. Meridian Southern Acid Phosphate	Storey & Co., Forest.....
6499	H. G. Meridian Southern Acid Phosphate	Holloway & Worthy, Carson.....
6692	H. G. Meridian Southern Acid Phosphate	Jack Gaston, Ackerman.....
6693	H. G. Meridian Southern Acid Phosphate	S. H. Andrews, Enterprise.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7354	12.37	6.58	3.41	9.99	2.01	1.31	2.30	19.53
7355	12.98	6.90	4.08	10.98	.73	1.31	2.24	20.58
	13.94	6.99	3.63	10.62	1.03	1.15	2.34	19.67
		8.00	2.00	10.00	2.00	1.00	2.00	18.10
6302	14.08	6.40	3.32	9.72	1.09	1.85	1.75	20.74
6368	15.60	6.72	2.95	9.67	.90	1.87	1.53	20.55
6498	13.23	6.33	3.59	9.92	.73	1.77	1.82	20.72
6595	12.99	6.61	2.83	9.44	1.19	1.81	1.48	19.99
6690	13.12	6.69	3.54	10.23	.81	1.77	1.85	21.13
6691	13.33	6.50	3.11	9.61	1.13	1.69	1.91	20.18
7356	12.97	6.40	2.73	9.13	1.43	1.91	1.71	20.29
7357	11.76	5.83	3.45	9.28	.96	2.15	1.88	21.55
7358	13.47	6.54	2.73	9.27	.91	2.14	1.74	21.41
	13.42	6.44	3.14	9.58	1.02	1.89	1.74	20.74
		7.00	2.00	9.00	2.00	1.80	1.50	19.53
7127	10.78				1.96	4.97	.96	21.96
7359	10.24				2.50	5.34	1.12	23.90
					1.50	4.50	.50	19.33
7360	7.83	2.05	4.73	6.78	4.95	3.12	3.24	23.87
7361	8.82	4.26	4.92	9.18	4.54	2.94	4.41	27.36
7585	7.24	1.67	5.18	6.85	5.13	2.92	3.60	23.52
	7.96	2.66	4.94	7.60	4.87	2.99	3.75	24.91
		5.00	4.00	9.00	2.00	3.00	4.00	27.00
7362	15.81				7.33	4.38	.87	22.19
					5.00	3.50	.63	17.22
6338	13.20	10.02	4.45	14.47	1.07			15.47
6339	15.30	10.93	3.20	14.13	1.52			15.22
6499	14.55	9.24	6.09	15.33	.67			16.25
6692	10.67	9.25	5.14	14.39	1.16			15.32
6693	12.76	9.01	5.98	14.99	.64			15.89

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7363	H. G. Meridian Southern Acid Phosphate	A. H. Fulton, Noxapater.....
7364	H. G. Meridian Southern Acid Phosphate	M. H. Turner, Vossburg.....
7365	H. G. Meridian Southern Acid Phosphate	L. N. Nobles, State Line.....
7366	H. G. Meridian Southern Acid Phosphate	W. B. Richardson, Newton.....
7367	H. G. Meridian Southern Acid Phosphate	G. P. McGehee, Gloster
7368	H. G. Meridian Southern Acid Phosphate	Wiygul Bros., Nettleton.....
7369	H. G. Meridian Southern Acid Phosphate	A. J. Cotton Merc. Co., Iuka.....
7370	H. G. Meridian Southern Acid Phosphate	J. A. McLeod, Hattiesburg.....
		Average.....
		Guarantee.....
6340	S. G. Meridian English Acid Phosphate.....	T. B. Gaddis, Morton.....
6500	S. G. Meridian English Acid Phosphate.....	Meridian Fertilizer Factory, Hattiesb'g
6694	G. S. Meridian English Acid Phosphate.....	Smith & Gibson, Union.....
6695	S. G. Meridian English Acid Phosphate.....	R. C. Coombs, Shuqualak.....
7371	S. G. Meridian English Acid Phosphate.....	Buckley & Son, Enterprise
7372	S. G. Meridian English Acid Phosphate.....	Phillips, Rinehart, Taylor Co., Booneville.....
7373	S. G. Meridian English Acid Phosphate.....	S. M. Hinton, Bay Springs.....
7374	S. G. Meridian English Acid Phosphate.....	Croom & Story, Lucedale.....
7375	S. G. Meridian English Acid Phosphate.....	J. W. Gulley, Louisville.....
7376	S. G. Meridian English Acid Phosphate.....	Phillips, Rinehart, Taylor Co., Booneville.....
7377	S. G. Meridian English Acid Phosphate.....	A. Roberts, Lauderdale.....
		Average.....
		Guarantee.....
6369	S. G. Meridian Blood & Bone	Barnes & Company, Columbia.....
6696	S. G. Meridian Blood & Bone	Rouse Bros. & Smith, Poplarville.....
7378	S. G. Meridian Blood & Bone	J. W. Gulley, Louisville.....
7379	S. G. Meridian Blood & Bone	J. N. Alexander & Co., Kosciusko.....
7380	S. G. Meridian Blood & Bone	R. H. Day & Co., Decatur.....
7381	S. G. Meridian Blood & Bone	R. Watts & Co., Seminary.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7363	13.50	9.30	6.06	15.36	.40			16.29
7364	14.48	8.35	6.92	15.27	.83			16.11
7365	13.23	9.68	5.46	15.14	.43			16.11
7366	15.54	10.04	4.71	14.75	.88			15.75
7367	12.74	9.27	6.10	15.37	.58			16.30
7368	15.97	9.45	3.92	13.37	1.30			14.32
7369	15.17	9.75	4.05	13.80	1.15			14.76
7370	14.30	10.16	5.55	15.71	.38			16.73
	13.95	9.57	5.20	14.77	.84			15.73
		<i>12.00</i>	<i>2.00</i>	<i>14.00</i>	<i>1.00</i>			<i>15.20</i>
6340	14.99	10.61	3.34	13.95	1.45			15.01
6500	14.35	9.49	5.63	15.12	.90			16.07
6694	15.27	9.33	4.51	13.84	.79			14.77
6695	15.13	9.67	4.33	14.00	1.01			14.97
7371	12.54	8.71	4.67	13.38	1.71			14.25
7372	14.85	9.63	4.29	13.92	1.27			14.88
7373	14.27	9.63	3.78	13.41	1.94			14.37
7374	16.07	10.43	3.56	13.99	1.62			15.03
7375	10.19	8.60	5.44	14.04	1.57			14.90
7376	15.17	9.72	4.10	13.82	1.34			14.79
7377	15.57	9.27	4.37	13.64	1.23			14.57
	14.40	9.55	4.36	13.91	1.35			14.87
		<i>10.00</i>	<i>2.00</i>	<i>12.00</i>	<i>1.00</i>			<i>13.00</i>
6369	11.75	6.69	3.18	9.87	.69	1.49	1.68	19.42
6696	14.13	7.45	2.46	9.91	1.09	1.53	1.95	20.01
7378	12.34	6.73	3.05	9.78	1.06	1.67	1.88	20.27
7379	12.80	7.11	2.94	10.05	1.28	1.66	1.99	20.69
7380	13.29	6.83	3.15	9.98	1.18	1.65	1.81	20.34
7381	11.19	6.67	2.90	9.57	1.19	1.65	1.86	19.93

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7382	S. G. Meridian Blood & Bone.	Walker-Durr Co., Pinola.....
7383	S. G. Meridian Blood & Bone.	S. H. Floyd Merc. Co., Shubuta.....
		Average.....
		Guarantee.....
6303	S. G. Meridian Home Mixture	Mars Bros., Philadelphia.....
6304	S. G. Meridian Home Mixture	Meridian Fertilizer Factory, Meridian
6341	S. G. Meridian Home Mixture	T. B. Gaddis, Morton.....
6342	S. G. Meridian Home Mixture	T. M. Steele, Forest.....
6370	S. G. Meridian Home Mixture	Barnes & Co., Columbia.....
6501	S. G. Meridian Home Mixture	J. H. Williams & Sons, Prentiss.....
6502	S. G. Meridian Home Mixture	Hawkins, McRaney Co., Bassfield.....
6596	S. G. Meridian Home Mixture	J. E. McNair, Lumberton.....
6597	S. G. Meridian Home Mixture	T. C. Rubel, McHenry.....
6598	S. G. Meridian Home Mixture	Bufkin & Davis, Waynesboro.....
6599	S. G. Meridian Home Mixture	Holloway & McRaney, Collins.....
6697	S. G. Meridian Home Mixture	Buckley & Son, Enterprise.....
6698	S. G. Meridian Home Mixture	A. Roberts & Co., Lauderdale.....
6699	S. G. Meridian Home Mixture	J. P. Meyer, Ellisville.....
6768	S. G. Meridian Home Mixture	Peets & Norman Co., Hazlehurst.....
7384	S. G. Meridian Home Mixture	A. J. Cotton Merc. Co., Iuka.....
7385	S. G. Meridian Home Mixture	A. E. Dalrymple & Sons Co., Amory....
7386	S. G. Meridian Home Mixture	Brand-West Hardware Co., Houston....
7387	S. G. Meridian Home Mixture	Phillips, Rinehart, Taylor Co., Booneville.....
7388	S. G. Meridian Home Mixture	R. C. Combs, Shuqualak.....
7389	S. G. Meridian Home Mixture	J. M. Carter, Quitman.....
7390	S. G. Meridian Home Mixture	L. N. Nobles, State Line.....
7391	S. G. Meridian Home Mixture	S. H. Floyd Merc. Co., Shubuta.....
7392	S. G. Meridian Home Mixture	Hicks Merc. Co., Laurel.....
7393	S. G. Meridian Home Mixture	Williams & Freeman, Sandersville.....
7394	S. G. Meridian Home Mixture	McLeod & Co., Purvis.....
7395	S. G. Meridian Home Mixture	D'Lo Merc. Co., D'Lo.....
7396	S. G. Meridian Home Mixture	J. P. Meyer, Ellisville.....
7397	S. G. Meridian Home Mixture	Smith & Gibson, Union.....
7398	S. G. Meridian Home Mixture	R. H. Day & Co., Decatur.....
7399	S. G. Meridian Home Mixture	S. M. Hinton, Bay Springs.....
7400	S. G. Meridian Home Mixture	Stephens & Ruffin, Richton.....
7401	S. G. Meridian Home Mixture	Walker-Durr Co., Pinola.....
7402	S. G. Meridian Home Mixture	R. Watts & Co., Seminary.....
7403	S. G. Meridian Home Mixture	Ainsworth & Mayfield, Taylorsville....
7404	S. G. Meridian Home Mixture	Donald Bros., Magee.....
7405	S. G. Meridian Home Mixture	G. P. McGehee, Gloster.....
7406	S. G. Meridian Home Mixture	Max Kahn, Gloster.....
7407	S. G. Meridian Home Mixture	Jack Gaston, Ackerman.....
7408	S. G. Meridian Home Mixture	G. Lowenberg, McCool.....
7409	S. G. Meridian Home Mixture	J. N. Alexander & Co., Kosciusko.....
7410	S. G. Meridian Home Mixture	Mrs. M. L. Brinson, Monticello.....
7411	S. G. Meridian Home Mixture	J. S. Eaton & Bro., Taylorsville.....
7412	S. G. Meridian Home Mixture	Sumrall Merc. Co., Sumrall.....
7413	S. G. Meridian Home Mixture	W. B. Richardson, Newton.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7382	10.59	6.69	4.11	10.80	.61	1.14	2.20	19.64
7383	13.22	5.50	4.34	9.84	.68	1.76	1.73	20.40
	12.41	6.71	3.27	9.98	.97	1.57	1.89	20.10
		8.00	1.50	9.50	1.00	1.65	1.50	19.58
6303	15.41	7.68	2.34	10.02	1.98	1.54	1.89	20.12
6304	16.48	5.81	3.01	8.82	.99	1.79	1.53	19.20
6341	11.41	5.58	2.88	8.46	.81	1.78	2.09	19.39
6342	17.05	5.81	2.88	8.69	.68	1.73	2.19	19.58
6370	14.70	7.83	2.31	10.14	1.37	1.53	1.55	19.84
6501	15.35	8.15	2.19	10.34	1.19	1.53	1.58	20.13
6502	14.40	7.89	1.90	9.79	1.62	1.68	1.97	20.54
6596	11.55	6.63	3.96	10.59	1.33	1.69	1.69	21.02
6597	14.97	7.45	1.77	9.22	1.88	1.88	2.00	20.71
6598	13.00	7.36	2.98	10.34	1.19	1.66	.97	19.87
6599	12.91	7.88	2.06	9.94	1.46	1.47	1.90	19.79
6697	13.68	7.37	2.37	9.74	1.27	1.62	1.91	20.13
6698	14.52	6.82	3.11	9.93	1.78	1.38	1.78	19.17
6699	11.05	6.63	3.80	10.43	1.25	1.87	2.36	22.33
6768	12.40	6.49	3.14	9.63	1.09	1.60	2.20	20.17
7384	11.39	5.90	4.49	10.39	.86	1.67	2.03	21.03
7385	12.49	7.24	3.53	10.77	.52	1.67	1.61	21.10
7386	12.07	6.74	3.38	10.12	1.42	1.62	1.78	20.33
7387	10.58	7.05	2.83	9.88	1.98	1.71	1.82	20.51
7388	11.89	7.15	3.12	10.27	.87	1.53	1.52	19.88
7389	10.94	7.16	3.87	11.03	1.48	1.50	1.65	20.75
7390	10.93	6.70	3.46	10.16	1.39	1.77	2.02	21.25
7391	12.33	7.78	2.57	10.35	.81	1.57	1.86	20.58
7392	8.89	5.85	3.89	9.74	.82	1.82	1.95	20.82
7393	12.12	7.32	3.31	10.63	.74	1.78	1.88	21.71
7394	10.45	5.95	4.13	10.08	.72	1.72	2.04	20.91
7395	10.14	6.09	4.28	10.37	.77	1.61	2.02	20.78
7396	13.24	6.95	4.38	11.33	1.34	1.79	2.11	22.74
7397	15.19	7.56	3.22	10.78	.55	1.66	1.74	20.26
7398	14.10	6.41	3.76	10.17	.64	1.73	1.58	20.57
7399	13.50	7.60	2.68	10.28	.92	1.71	1.76	20.93
7400	12.76	6.33	3.37	9.70	.75	1.72	2.21	20.72
7401	11.48	6.13	4.77	10.90	.78	1.88	1.80	22.19
7402	14.51	7.61	3.21	10.82	.81	1.69	1.80	21.49
7403	11.71	6.41	3.36	9.77	.69	1.71	1.85	20.36
7404	11.75	6.43	3.56	9.99	.78	1.64	1.93	20.41
7405	11.05	6.51	3.66	10.17	1.25	1.89	1.76	21.42
7406	11.92	6.72	3.81	10.53	1.25	1.79	1.94	21.65
7407	13.02	7.38	2.95	10.33	.51	1.77	1.53	20.94
7408	12.37	7.39	3.68	11.07	.77	1.64	1.87	21.63
7409	12.33	6.15	4.21	10.36	.58	1.80	1.62	21.07
7410	13.07	7.52	3.24	10.76	.74	1.49	1.95	20.79
7411	11.35	5.85	4.24	10.09	.78	1.83	1.79	21.06
7412	12.18	6.36	4.41	10.77	.75	1.72	1.51	21.10
7413	12.96	7.60	3.35	10.95	.51	1.62	1.36	20.85

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7414	S. G. Meridian Home Mixture	J. L. Wells, Hickory.....
7415	S. G. Meridian Home Mixture	Brandon Merc. Co., Brandon.....
7416	S. G. Meridian Home Mixture	Floyd Loper, Lake.....
7417	S. G. Meridian Home Mixture	W. J. Gulley, Louisville.....
7418	S. G. Meridian Home Mixture	Croom & Story, Lucedale.....
		Average.....
		Guarantee.....
6305	H. G. Meridian Vegetable Grower.....	Meridian Fertilizer Factory, Meridian
6503	H. G. Meridian Vegetable Grower.....	Meridian Fertilizer Factory, Hattiesb'g
6600	H. G. Meridian Vegetable Grower.....	T. C. Rubel, McHenry.....
7419	H. G. Meridian Vegetable Grower.....	Meridian Fertilizer Factory, Meridian
7420	H. G. Meridian Vegetable Grower.....	Holloway & McRaney, Collins.....
		Average.....
		Guarantee.....
6601	S.G.Meridian German Kainit.	Threefoot Bros. & Co., Meridian.....
6700	S.G.Meridian German Kainit.	Buckley & Son, Enterprise.....
7421	S.G.Meridian German Kainit.	Davis & Bufkin, Buckatunna.....
7422	S.G.Meridian German Kainit.	R. C. Combs, Shuqualak.....
7423	S.G.Meridian German Kainit.	J. K. Kirkland, Quitman.....
		Average.....
		Guarantee.....
	MISSISSIPPI FERTILIZER CO., Jackson, Miss.	
7424	S. G. Acid Phosphate	Z. Wardlaw, Utica.....
		Guarantee.....
6343	S. G. Horse Shoe Brand.....	J. M. Lyle, Forest.....
6371	S. G. Horse Shoe Brand.....	Collins Bros., Tylertown.....
6504	S. G. Horse Shoe Brand.....	S. S. Dale & Sons, Prentiss.....
7425	S. G. Horse Shoe Brand.....	F. L. Riley Merc. Co., New Hebron.....
7426	S. G. Horse Shoe Brand.....	McCullum & Co., Weathersby.....
7427	S. G. Horse Shoe Brand.....	J. L. Hammond, Kosciusko.....
		Average.....
		Guarantee.....
6701	S. G. Improved Miss. Mixt. ..	C. C. Bates & Co., Liberty.....
6702	S. G. Improved Miss. Mixt. ..	D. C. Griffith, Silver Creek.....
6747	S. G. Improved Miss. Mixt. ..	C. Atkinson's Sons Co., Summit.....
7428	S. G. Improved Miss. Mixt.....	J. S. Eaton & Bro., Taylorsville.....
7429	S. G. Improved Miss. Mixt.....	J. A. Taylor & Son, Pelahatchie.....
		Average.....
		Guarantee.....
	MT. PLEASANT FERT'ZER CO., Mt. Pleasant, Tenn.	
7058	Big Success H. G. Mt. Pleasant Special Acid Phos.	J. W. Cooper, New Hope.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7414	13.46	7.23	3.04	10.27	.78	1.85	1.03	20.61
7415	12.69	7.06	3.61	10.67	1.01	1.64	1.09	20.26
7416	14.09	4.11	3.08	7.19	.56	2.07	2.11	19.03
7417	9.65	6.69	4.14	10.83	1.10	1.78	1.71	21.67
7418	12.28	7.04	2.98	10.02	1.23	1.59	2.23	20.65
	12.67	6.83	3.32	10.15	1.03	1.69	1.80	20.68
		8.00	1.50	9.50	1.00	1.65	1.50	19.58
6305	14.03	4.99	3.80	8.79	.70	2.05	3.16	22.00
6503	14.73	6.52	1.72	8.24	.93	2.23	6.27	25.85
6600	13.83	6.63	1.86	8.49	.81	2.27	6.03	26.02
7419	10.89	6.54	3.04	9.58	1.82	2.55	3.78	25.74
7420	9.75	4.61	3.44	8.05	.45	3.14	2.82	25.12
	12.65	5.86	2.77	8.63	.94	2.45	4.41	24.95
		6.00	2.00	8.00	1.00	2.50	5.00	25.15
6601	4.86						12.09	13.90
6700	5.50						14.16	16.28
7421	3.85						12.06	13.87
7422	1.13						13.00	14.95
7423	6.67						11.62	13.36
	4.40						12.58	14.47
							12.00	13.80
7424	13.76	9.53	3.45	12.98	1.18			13.93
		10.00	2.00	12.00	1.00			13.00
6343	10.63	7.66	3.02	10.68	.42	1.67	2.53	22.10
6371	10.10	7.78	2.98	10.76	.23	1.68	2.33	22.01
6504	11.90	7.74	3.24	10.98	.33	1.58	2.35	21.87
7425	9.79	8.06	3.12	11.18	.36	1.68	2.46	22.65
7426	9.58	7.88	2.97	10.85	.26	1.67	2.37	22.13
7427	10.62	7.98	2.64	10.62	.33	1.75	2.29	22.11
	10.44	7.85	2.99	10.84	.32	1.67	2.39	22.14
		7.50	2.00	9.50	1.00	1.65	1.80	19.87
6701	11.24	8.17	2.07	10.24	.72	1.56	2.86	21.61
6702	10.56	8.26	2.84	11.10	.26	1.72	2.90	23.25
6747	9.09	8.65	2.92	11.57	.37	1.57	2.42	22.66
7428	9.52	8.15	3.06	11.21	.27	1.63	2.35	22.37
7429	10.04	7.59	2.84	10.43	.68	1.52	2.49	21.18
	10.09	8.17	2.74	10.91	.46	1.60	2.60	22.21
		7.50	2.00	9.50	1.00	1.65	1.80	19.87
7058	10.73	9.39	4.64	14.03	3.74			14.97

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7430	Big Success H. G. Mt. Pleasant Special Acid Phos.	Bramlitt Hardware Co., Corinth..... Guarantee.....
7059	Big Success S. G. Banner Grain Grower.....	J. W. Cooper, New Hope
7431	Big Success S. G. Banner Grain Grower	J. B. Stopp, Iuka..... Guarantee.....
7432	H. G. Black Patch Grain & Seeding Down.....	B. C. Pace, Iuka..... Guarantee.....
7060	S. G. German Kainit..... NEW ORLEANS ACID & FERT. COMPANY, New Orleans, La.	J. W. Cooper, New Hope..... Guarantee.....
6703	S. G. Black Diamond Acid Phosphate.....	T. B. Bonner, Laurel.....
7433	S. G. Black Diamond Acid Phosphate.....	K. Green, Shuqualak.....
7434	S. G. Black Diamond Acid Phosphate.....	J. A. Spann, Pelahatchie.....
7435	S. G. Black Diamond Acid Phosphate.....	Planters Merc. Co., Woodville..... Average..... Guarantee.....
6704	S. G. Crescent City Acid Phosphate.....	J. P. Meyer, Ellisville..... Guarantee.....
7436	S. G. Am. R. B. Superphos. and Potash	J. D. Gambell, Mize.....
7437	S. G. Am. R. B. Superphos. and Potash	Stephens & Ruffin, Richton..... Guarantee.....
6602	S. G. Blood, Bone & Beef	J. L. Moyse & Bro., Summit.....
7438	S. G. Blood, Bone & Beef	W. H. Gallaspy's Sons Co., Hickory....
7439	S. G. Blood, Bone & Beef	McComb City Merc. Co., McComb City Average..... Guarantee.....
7440	S. G. Dissolved Bone & Potash.....	Berry & Williams, Braxton.....
7441	S. G. Dissolved Bone & Potash.....	Donald Bros., Magee..... Guarantee.....
6306	S. G. Goldsmith's Imp. Mixt..	McComb City Merc. Co., McComb City
6705	S. G. Goldsmith's Imp. Mixt..	K. Green, Shuqualak.....
6706	S. G. Goldsmith's Imp. Mixt..	E. E. Bonner, Sandersville.....
7442	S. G. Goldsmith's Imp. Mixt..	M. H. Clayton Co., Heidelberg.....
7443	S. G. Goldsmith's Imp. Mixt..	J. A. Goree, Columbus.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7430	15.11	10.32 12.00	3.70 2.00	14.02 14.00	2.32 2.00			15.05 15.20
7059	13.26	5.91	5.01	10.92	5.36		1.77	14.64
7431	13.85	5.27 7.00	4.91 3.00	10.18 10.00	4.70 5.00		2.46 2.00	14.55 14.00
7432	15.52	6.41 7.00	3.32 3.00	9.73 10.00	.94 5.00	1.52 1.65	2.37 2.00	20.15 20.60
7060	.80						12.46 12.40	14.33 14.26
6703	11.11	8.81	4.52	13.33	.31			14.21
7433	14.51	7.68	3.38	11.06	2.17			11.83
7434	14.56	7.22	4.62	11.84	1.35			12.56
7435	9.97 12.54	9.34 8.26 10.00	3.59 4.03 2.00	12.93 12.29 12.00	1.36 1.29 2.00			13.86 13.12 13.00
6704	10.41	10.57 10.00	4.38 2.00	14.95 12.00	.70 2.00			16.01 13.00
7436	10.88	6.81	3.87	10.68	.38	1.74	1.20	20.77
7437	10.00	5.39 7.00	4.69 2.00	10.08 9.00	1.09 2.00	1.69 1.65	1.59 1.50	20.22 18.93
6602	11.13	6.01	4.92	10.93	.12	1.47	1.08	19.75
7438	11.34	5.87	4.99	10.86	.19	1.94	1.47	21.98
7439	10.57 11.01	5.41 5.76 7.00	3.83 4.58 2.00	9.24 10.34 9.00	.54 28 2.00	2.01 1.81 1.65	1.42 1.32 1.50	20.38 20.70 18.93
7440	13.65	5.31	4.70	10.01	.70		1.66	13.45
7441	8.92	8.11 8.00	2.89 2.00	11.00 10.00	.77 2.00		2.00 2.00	15.21 14.10
6306	12.35	5.86	3.17	9.03	.18	1.63	1.43	18.68
6705	14.60	6.56	2.56	9.12	1.01	1.93	1.79	20.47
6706	13.95	7.30	2.90	10.20	.38	1.39	1.89	19.68
7442	18.15	5.26	3.41	8.67	.38	1.66	1.73	18.69
7443	15.20	4.59	3.15	7.74	.58	1.61	1.69	17.36

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7444	S. G. Goldsmith's Imp. Mixt.	McLain & Ratcliff, Gloster..... Average..... Guarantee.....
6707	S. G. Jack Gaston's Cotton and Corn.....	Jack Gaston, Ackerman Guarantee.....
6372	H. G. Ground Bone.....	Osyka Merc. Co., Osyka.....
6603	H. G. Ground Bone.....	J. L. Moyse & Bro., Summit..... Guarantee.....
	NEWTON OIL & M'F'G. CO., Newton, Miss.	
6307	H. G. Acid Pdosphate.....	Newton Oil & M'f'g. Co., Newton.....
6708	H. G. Acid Phosphate.....	Newton Oil & M'f'g. Co., Newton..... Guarantee.....
7445	S. G. Acid Phosphate.....	McMullen & Son, Hickory.....
7446	S. G. Acid Phosphate.....	Smythe Gaddis & Co., Forest..... Guarantee.....
6308	S. G. Banner C. & C. Brand.....	Newton Oil & M'f'g. Co., Newton.....
6373	S. G. Banner C. & C. Brand.....	J. T. Lewis, Neshoba.....
6709	S. G. Banner C. & C. Brand.....	C. W. Alexander, Montrose.....
7447	S. G. Banner C. & C. Brand.....	Mott Bros., Union..... Average..... Guarantee.....
6710	S. G. Pine Land Guano.....	McMullen & Son, Hickory.....
7448	S. G. Pine Land Guano.....	S. M. Hinton, Bay Springs..... Guarantee.....
	PLANTERS FERTILIZER & CHEMICAL COMPANY, New Orleans, La.	
7449	S. G. Planters Acid Phos.....	Robinson Merc. Co., Centreville.....
7450	S. G. Planters Acid Phos.....	McLain & Ratcliff, Gloster..... Guarantee.....
7451	S. G. Planters Golden Mixt....	Morris H. Rothchild, Woodville..... Guarantee.....
6781	S. G. Planters R. B. Super-phosphate.....	Hyman Merc. Co., Summit.....
6782	S. G. Planters R. B. Super-phosphate.....	C. Atkinson's Sons Co., Summit..... Guarantee.....
6783	S. G. German Kainit.....	C. Atkinson's Sons Co., Summit..... Guarantee.....
	REFUGE COTTON OIL CO., Columbus, Miss.	
7452	Refuge H. G. Acid Phos.	J. B. Mitchell, Ackerman.....
7453	Refuge H. G. Acid Phos.	H. B. Vaughn, Steenston..... Guarantee.....
6309	S. G. Columbus Home Made Fertilizer.....	Stewart, Donald & Son, Philadelphia....
6374	S. G. Columbus Home Made Fertilizer.....	Refuge Cotton Oil Co., Columbus.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7444	13.47	7.75	2.57	10.32	.45	1.72	1.45	20.67
	14.62	6.22	2.96	9.18	.49	1.66	1.66	19.26
		7.00	2.00	9.00	2.00	1.65	1.50	18.93
6707	12.95	6.51	2.53	9.04	1.05	1.68	1.68	19.25
		7.00	2.00	9.00	2.00	1.65	1.50	18.93
6372	3.65				22.36	3.17		23.86
6603	3.35				22.27	3.08		23.46
					18.00	3.00		21.00
6307	13.60	10.87	4.39	15.26	1.36			16.35
6708	12.47	10.13	4.90	15.03	1.14			16.04
		12.00	2.00	14.00	2.00			15.20
7445	10.29	7.73	9.08	16.81	.09			17.58
7446	8.87	7.34	7.66	15.00	2.25			15.73
		10.00	2.00	12.00	2.00			13.00
6308	11.73	6.90	2.83	9.73	1.00	1.60	2.28	20.42
6373	11.25	7.24	3.07	10.31	1.02	1.50	2.08	20.46
6709	12.50	7.07	3.13	10.20	.93	1.30	2.94	20.51
7447	10.08	4.41	4.65	9.06	1.10	1.54	2.56	19.51
	11.39	6.40	3.42	9.82	1.01	1.49	2.46	20.23
		7.00	1.50	8.50	2.00	1.65	2.25	19.24
6710	10.52	6.19	2.97	9.16	2.44	1.61	2.61	20.14
7448	12.12	4.17	3.44	7.61	1.54	1.49	2.57	17.70
		7.00	1.50	8.50	2.00	1.65	2.25	19.24
7449	13.11	7.37	4.69	12.06	1.43			12.80
7450	9.01	6.97	4.76	11.73	.54			12.43
		10.00	2.00	12.00	2.00			13.00
7451	12.12	7.92	3.08	11.00	.70	1.59	2.38	21.99
		7.50	2.00	9.50	2.00	1.65	1.50	19.53
6781	12.24	6.90	2.38	9.28	.60	1.83	1.13	19.52
6782	12.12	7.27	2.24	9.51	.47	1.77	1.10	19.53
		7.50	2.00	9.50	2.00	1.65	1.50	19.53
6783	3.08						12.48	14.35
							12.00	13.80
7452	12.94	8.90	7.47	16.37	.40			17.26
7453	14.77	6.43	6.16	12.59	1.94			13.23
		12.00	2.00	14.00	2.00			15.20
6309	12.75	5.99	2.82	8.81	.85	1.83	1.68	19.54
6374	12.10	6.52	2.75	9.27	.89	1.48	2.02	19.09

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
6657	S. G. Columbus Home Made Fertilizer.....	J. S. Brasfield, Louisville.....
6711	S. G. Columbus Home Made Fertilizer.....	J. T. McClure, Shuqualak.....
7061	S. G. Columbus Home Made Fertilizer.....	G. D. McKellar, New Hope.....
7454	S. G. Columbus Home Made Fertilizer.....	D. F. Holland, Maben.....
7455	S. G. Columbus Home Made Fertilizer.....	J. S. Brassfield, Louisville.....
7456	S. G. Columbus Home Made Fertilizer.....	J. A. Hickman, Noxapater.....
7457	S. G. Columbus Home Made Fertilizer.....	Donald & Son, Philadelphia.....
7458	S. G. Columbus Home Made Fertilizer.....	A. B. Norris, West Point.....
7459	S. G. Columbus Home Made Fertilizer.....	H. B. Vaughn, Steenston.....
7460	S. G. Columbus Home Made Fertilizer.....	Bourland Bros., Amory.....
7461	S. G. Columbus Home Made Fertilizer.....	Imperial Cotton Oil Co., Macon.....
		Average.....
	SHUBUTA OIL & M'F'G. Co., Shubuta, Miss.	Guarantee.....
7462	H. G. Shubuta Acid Phos.....	Shubuta Oil & M'f'g. Co., Shubuta....
		Guarantee.....
6604	S. G. Shubuta Mixture	Shubuta Oil & M'f'g. Co., Shubuta....
7463	S. G. Shubuta Mixture	Shubuta Oil & M'f'g. Co., Shubuta....
		Guarantee.....
	SOUTHERN OIL & FERT. Co., Meridian, Miss.	
6310	Southern's 20th Century H. G. Acid Phosphate	Meyer Bros., Meridian.....
6712	Southern's 20th Century H. G. Acid Phosphate	K. Green, Shuqualak.....
		Guarantee.....
6605	Southern's S. G. Acid Phosphate.....	Meyer Bros., Meridian.....
7464	Southern's S. G. Acid Phosphate.....	Winner, Klein & Co., Meridian.....
		Guarantee.....
6311	S. G. Southern's Cot. Grower	Meyer Bros., Meridian.....
6312	S. G. Southern's Cot. Grower	Southern Oil & Fertilizer Co., Meridian
7465	S. G. Southern's Cot. Grower	L. L. Price, Toomsaba.....
7466	S. G. Southern's Cot. Grower	J. P. Meyer, Ellisville.....
		Average.....
		Guarantee.....
6606	S. G. Southern's Superior.....	Winner Klein & Co., Meridian.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6657	11.79	5.90	3.15	9.05	.82	1.90	2.01	20.46
6711	11.45	6.54	2.35	8.89	.90	1.65	1.94	19.26
7061	10.73	6.65	3.31	9.96	.93	1.79	1.69	20.72
7454	13.37	6.65	4.17	10.82	.63	1.52	1.70	20.60
7455	12.08	6.56	3.68	10.24	.52	1.59	1.89	20.45
7456	10.77	6.04	4.55	10.59	.65	1.69	1.74	21.01
7457	10.28	5.87	4.69	10.56	.83	1.82	1.83	21.59
7458	10.31	6.45	4.02	10.47	.72	1.88	1.67	21.60
7459	9.98	6.20	4.47	10.67	.68	1.78	1.87	21.63
7460	10.58	7.02	3.29	10.31	.51	1.95	1.93	22.06
7461	9.60	5.90	3.63	9.53	.27	1.80	1.59	20.10
	11.21	6.33	3.61	9.94	.71	1.74	1.82	20.62
		<i>8.00</i>	<i>2.00</i>	<i>10.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>20.13</i>
7462	14.48	12.50	3.46	15.96	.61			17.21
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>1.00</i>			<i>15.00</i>
6604	10.00	4.76	5.96	10.72	.51	1.93	1.53	21.75
7463	11.21	6.87	3.17	10.04	.30	1.99	1.90	21.88
		<i>6.00</i>	<i>3.00</i>	<i>9.00</i>	<i>1.00</i>	<i>1.65</i>	<i>1.60</i>	<i>18.94</i>
6310	14.05	10.36	2.48	12.84	2.09			13.88
6712	11.75	9.45	3.96	13.41	1.02			14.36
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>2.00</i>			<i>15.00</i>
6605	15.78	9.89	4.15	14.04	.91			15.03
7464	14.64	9.70	4.62	14.32	.95			15.29
		<i>9.00</i>	<i>3.00</i>	<i>12.00</i>	<i>2.00</i>			<i>12.90</i>
6311	12.90	7.01	3.25	10.26	.28	1.68	1.56	20.50
6312	13.36	7.75	1.98	9.73	1.77	1.52	1.39	19.16
7465	12.43	6.78	3.74	10.52	.43	1.88	1.61	21.62
7466	12.21	6.49	2.58	9.07	.61	2.07	1.97	21.17
	12.72	7.01	2.89	9.90	.77	1.79	1.63	20.62
		<i>6.00</i>	<i>3.00</i>	<i>9.00</i>	<i>1.00</i>	<i>1.65</i>	<i>1.00</i>	<i>18.25</i>
6606	13.58	7.32	2.67	9.99	1.11	1.58	1.37	19.62

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
7467	S. G. Southern's Superior..... STANDARD GUANO & CHEMICAL M'F'G. COMPANY, New Orleans, La.	McGough Bros., Morton..... Guarantee.....
6313	Stern's H. G. Acid Phosphate	C. Atkinson's Sons Co., Summit.....
6375	Sterns' H. G. Acid Phosphate	The Lampton Bros. & Co., Tylertown.....
6505	Stern's H. G. Acid Phosphate	J. H. Williams & Sons, Prentiss.....
6713	Stern's H. G. Acid Phosphate	J. M. Kelly, Gandsi..... Average..... Guarantee.....
6386	S. G. Champion Farmer's Choice.....	G. Lowenberg & Co., Kosciusko.....
6714	S. G. Champion Farmer's Choice.....	R. W. Hinton Co., Lumberton..... Guarantee.....
6314	S. G. Miss. Home Guano.....	C. Atkinson's Sons Co., Summit.....
6506	S. G. Miss. Home Guano.....	R. L. Berry & Bro., Prentiss.....
6507	S. G. Miss. Home Guano.....	Rankin & Co., Columbia.....
6715	S. G. Miss. Home Guano.....	J. S. Eaton & Bro., Taylorsville.....
7468	S. G. Miss. Home Guano.....	Bourland Bros., Amory.....
7469	S. G. Miss. Home Guano.....	L. C. Smith, Lauderdale..... Average..... Guarantee.....
6315	H. G. Pure Raw Ground Bone.....	C. Atkinson's Sons Co., Summit.....
6376	H. G. Pure Raw Ground Bone.....	The Lampton Bros. & Co., Tylertown..... Guarantee.....
6377	S. G. Stern's Am. R. B. Superphosphate.....	I. N. Varnado Sons Co., Osyka.....
6378	S. G. Stern's Am. R. B. Superphosphate.....	The Lampton Co., Columbia.....
6508	S. G. Stern's Am. R. B. Superphosphate.....	R. L. Berry & Bro., Prentiss.....
6509	S. G. Stern's Am. R. B. Superphosphate.....	Rankin & Co., Columbia.....
6607	S. G. Stern's Am. R. B. Superphosphate.....	John McGrath & Sons, Brookhaven....
6608	S. G. Stern's Am. R. B. Superphosphate.....	Wise Merc. Co., Hazlehurst.....
6609	S. G. Stern's Am. R. B. Superphosphate.....	Holloway & McRaney, Collins.....
6716	S. G. Stern's Am. R. B. Superphosphate.....	Johnson-Woodward Co., Mt. Olive.....
6717	S. G. Stern's Am. R. B. Superphosphate.....	Hudson & Co., Sumrall.....
6718	S. G. Stern's Am. R. B. Superphosphate.....	F. L. Riley Merc. Co., New Hebron....
7470	S. G. Stern's Am. R. B. Superphosphate.....	McLeod & Co., Purvis.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7467	12.72	6.60 5.00	3.37 3.00	9.97 8.00	.45 1.00	1.98 1.65	1.91 2.00	21.74 18.20
6313	15.15	11.75	2.25	14.00	1.49			15.18
6375	16.45	11.26	2.70	13.96	1.05			15.09
6505	12.73	11.69	2.78	14.47	1.23			15.64
6713	15.47	11.81	2.31	14.12	2.14			15.30
	14.95	11.63	2.51	14.14	1.48			15.30
		12.00	2.00	14.00	2.00			15.20
6386	13.96	8.05	2.16	10.21	1.79	1.53	1.25	19.59
6714	13.15	8.06 7.00	2.31 2.50	10.37 9.50	1.39 1.00	1.82 1.65	1.35 1.00	21.05 18.90
6314	13.91	7.77	2.63	10.40	1.28	1.51	1.93	20.48
6506	15.40	7.54	1.95	9.49	1.61	1.43	2.01	19.22
6507	14.08	8.01	2.11	10.12	1.47	1.37	2.20	19.94
6715	14.13	7.71	2.07	9.78	1.37	1.53	2.00	19.95
7468	12.42	8.56	2.45	11.01	.45	1.58	2.07	21.67
7469	12.21	7.79	2.29	10.08	1.07	1.84	2.06	21.60
	13.69	7.90	2.25	10.15	1.21	1.54	2.04	20.47
		7.00	2.50	9.50	1.00	1.65	1.50	19.48
6315	6.10				19.33	3.14		22.23
6376	5.70				17.01 18.50	3.10 2.50		20.91 19.25
6377	14.30	5.64	4.36	10.00	1.01	1.75	1.50	20.29
6378	14.90	6.59	3.71	10.30	1.05	1.63	1.41	20.13
6508	15.60	4.76	4.85	9.61	.73	1.70	1.54	19.62
6509	14.68	7.55	2.15	9.70	.90	1.83	1.62	20.61
6607	15.78	6.72	3.46	10.18	.75	1.87	1.65	21.25
6608	14.48	7.42	2.71	10.13	.81	2.02	1.65	21.86
6609	14.55	7.48	2.43	9.91	.77	1.81	1.66	20.80
6716	13.91	6.37	3.48	9.85	.84	1.71	1.64	20.20
6717	14.43	6.19	3.97	10.16	1.00	1.74	1.52	20.50
6718	13.92	5.30	4.63	9.93	1.19	1.70	1.51	19.99
7470	16.34	5.73	4.38	10.11	.87	1.82	1.55	20.76

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
7471	S. G. Stern's Am. R. B. Superphosphate SWIFT FERTILIZER WORKS, Atlanta, Ga.	Rawls & Lampton Co., Silver Creek.... Average..... Guarantee.....
7473	Swift's Golden Harvest S. G. Guano.....	T. S. Green, Guntown..... Guarantee.....
6719	Swift's Red Steer S.G.Guano.	W. J. Gulley, Louisville.....
6720	Swift's Red Steer S.G.Guano.	F. L. Riley Merc. Co., New Hebron...
7474	Swift's Red Steer S.G.Guano.....	Ross Bros. & Sumner, Pelahatchie.... Average..... Guarantee.....
	TENNESSEE CHEMICAL Co., Nashville, Tenn.	
6721	Ox H. G. Dissolved Bone.....	W. A. Lyle, Lauderdale.....
7062	Ox H. G. Dissolved Bone.....	G. D. McKellar, New Hope..... Guarantee.....
6722	Ox S. G. Cotton Guano	Jack Gaston, Ackerman.....
7475	Ox S. G. Cotton Guano	E. W. Cochran, Guntown.....
7476	Ox S. G. Cotton Guano	J. W. Gulley, Louisville..... Average..... Guarantee.....
	TENNESSEE VALLEY FERT. COMPANY, Florence, Ala.	
7477	S. G. Dissolved Bone	J. G. Callicott & Son, Iuka..... Guarantee.....
7478	S. G. Ashcroft's Formula	J. G. Callicott & Son, Iuka.....
7479	S. G. Ashcroft's Formula	J. B. Splann, Corinth..... Guarantee.....
7480	S. G. King Cotton Grower	Booneville Merc. Co., Booneville.....
7481	S. G. King Cotton Grower	T. J. Phillips, Houka..... Guarantee.....
	THREEFOOT BROS. & Co., Meridian, Miss.	
6316	Threefoot's H. G. English Acid Phosphate	Threefoot Bros. & Co., Meridian.....
6723	Threefoot's H. G. English Acid Phosphate	Johnson & Hand, Ellisville..... Guarantee.....
6317	Threefoot's S. G. Improved Mixture	Herndeson & Molphus Co., Philadelphia
6318	Threefoot's S. G. Improved Mixture	Threefoot Bros. & Co., Meridian.....
7482	Threefoot's S. G. Improved Mixture	R. H. Reed, Vossburg.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7471	15.04	5.41	5.07	10.48	.95	1.73	1.40	20.60
	14.83	6.26	3.77	10.03	.91	1.78	1.55	20.56
		7.00	2.50	9.50	1.00	1.65	1.50	19.48
7473	7.89	4.25	4.30	8.55	.88	1.88	1.94	19.58
		5.50	2.50	8.00	1.50	1.65	2.00	18.25
6719	8.20	6.14	2.31	8.45	1.04	1.74	1.74	18.87
6720	8.32	5.26	3.22	8.48	.91	1.63	1.80	18.44
7474	7.18	3.65	4.55	8.20	1.74	1.91	1.93	19.24
	8.23	5.02	3.36	8.38	1.23	1.76	1.82	18.85
		5.50	2.50	8.00	1.50	1.65	2.00	18.25
6721	15.03	10.27	3.19	13.46	.90			14.49
	14.29	9.13	4.43	13.56	3.21			14.47
		8.00	6.00	14.00	1.00			14.80
6722	10.10	7.25	4.27	11.52	3.07	1.77	1.24	21.90
7475	12.79	7.50	2.60	10.10	1.32	2.02	1.71	21.91
7476	12.56	4.25	5.77	10.02	.78	1.82	.81	19.66
	11.82	6.33	4.21	10.54	1.72	1.87	1.25	21.15
		6.00	4.00	10.00	1.00	1.65	1.00	19.35
7477	12.34	7.88	5.24	13.12	3.57			13.91
		10.00	2.00	12.00	2.00			13.00
7478	15.26	7.14	4.23	11.37	3.52		1.15	14.54
7479	17.45	7.55	4.52	12.07	3.93		1.07	15.26
		8.45	2.00	10.45	1.55		2.19	14.86
7480	15.29	4.21	4.30	8.51	2.07	1.43	1.77	17.54
7481	11.18	4.29	6.71	11.00	3.02	.92	1.34	17.75
		7.00	2.00	9.00	2.00	1.65	1.00	18.35
6316	15.41	10.14	3.18	13.22	1.64			14.33
6723	14.02	9.76	4.45	14.21	.96			15.19
		13.00	2.00	15.00	1.00			16.30
6317	14.50	7.46	2.18	9.64	2.37	1.52	1.72	19.41
6318	16.38	6.81	3.12	9.93	.35	1.64	1.46	19.84
7482	15.06	7.61	2.81	10.42	.87	1.50	1.42	19.86

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7483	Threefoot's S. G. Improved Mixture	J. M. Carter, Quitman..... Average..... Guarantee.....
	TUPELO FERTILIZER FACTORY, Tupelo, Miss.	
6658	H. G. Cotton Belt Acid	
	Phosphate.....	J. T. McClure, Shuqualak.....
6724	H. G. Cotton Belt Acid	
	Phosphate.....	J. W. Jenkins, Shuqualak.....
7484	H. G. Cotton Belt Acid	
	Phosphate.....	T. M. Clark, Verona.....
7485	H. G. Cotton Belt Acid	
	Phosphate.....	H. M. and A. J. Patterson, Philadelphia.....
7486	H. G. Cotton Belt Acid	
	Phosphate.....	Gilmore & May Co., Amory.....
7487	H. G. Cotton Belt Acid	
	Phosphate.....	State Line Merc. Co., State Line.....
		Average.....
		Guarantee.....
6379	S. G. Cotton Belt Fertilizer	J. J. Rogers, Tupelo.....
6659	S. G. Cotton Belt Fertilizer	L. C. Smith, Lauderdale.....
6725	S. G. Cotton Belt Fertilizer	J. W. Jenkins, Shuqualak.....
7488	S. G. Cotton Belt Fertilizer	Barnett Supply Co., Booneville.....
7489	S. G. Cotton Belt Fertilizer	J. D. Feestick, Rienzi.....
7490	S. G. Cotton Belt Fertilizer	J. W. Gulley, Louisville.....
7491	S. G. Cotton Belt Fertilizer	H. M. & A. J. Patterson, Philadelphia.....
7492	S. G. Cotton Belt Fertilizer	J. D. Fisher, Quitman.....
7493	S. G. Cotton Belt Fertilizer	J. M. Walker, West Point.....
7494	S. G. Cotton Belt Fertilizer	Witty Merc. Co., Winona.....
7495	S. G. Cotton Belt Fertilizer	Wiygul Bros., Nettleton.....
7496	S. G. Cotton Belt Fertilizer	F. W. Bransby, Macon.....
		Average.....
		Guarantee.....
7497	S. G. Tupelo Fertilizer.....	W. S. Johnson & Sons, Verona.....
7498	S. G. Tupelo Fertilizer.....	W. G. Francis, Nettleton.....
		Guarantee.....
7499	S. G. German Kainit.....	S. P. Dalrymple, Guntown.....
7500	S. G. German Kainit.....	Tupelo Merc. Co., Tupelo.....
		Guarantee.....
	VIRGINIA-CAROLINA CHEM-	
	ICAL COMPANY,	
	Memphis, Tenn.	
6319	S. G. I. X. L. Acid Phos.....	Mott Bros., Union.....
6726	S. G. I. X. L. Acid Phos.....	Seward & Fancher, McCool.....
6727	S. G. I. X. L. Acid Phos.....	F. W. Bransby, Macon.....
7501	S. G. I. X. L. Acid Phos.....	Lucedale Commercial Co., Lucedale.....
7502	S. G. I. X. L. Acid Phos.....	Davis & Bufkin, Buckatunna.....
7503	S. G. I. X. L. Acid Phos.....	J. D. Green, & Co., Verona.....
		Average.....
		Guarantee.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7483	15.97 15.48	5.96 6.96 7.50	3.31 2.86 2.00	9.27 9.82 9.50	.42 1.00 1.00	2.07 1.68 1.64	2.13 1.68 1.60	21.52 20.15 19.60
6658	13.58	13.24	2.28	15.52	1.24			16.84
6724	13.39	10.38	4.05	14.43	1.22			15.47
7484	11.34	7.61	7.17	14.78	.05			15.54
7485	14.27	9.10	5.71	14.81	.93			15.72
7486	14.28	9.54	4.55	14.09	1.29			15.04
7487	13.58 15.07	7.23 9.52 12.00	6.83 5.09 2.00	14.06 14.61 14.00	.95 .96 2.00			14.78 15.56 15.20
6379	13.73	9.01	3.13	12.14	1.07	1.37	1.08	20.98
6659	12.34	8.03	2.41	10.44	1.06	1.84	1.87	21.80
6725	12.25	7.68	3.14	10.82	.86	1.78	1.53	21.55
7488	12.37	6.46	3.56	10.02	.93	1.86	1.63	20.98
7489	12.34	6.78	4.12	10.90	1.04	1.81	1.28	21.38
7490	11.08	7.60	3.33	10.93	.67	1.87	1.64	22.15
7491	11.66	7.54	3.12	10.66	.92	1.96	1.49	22.03
7492	11.01	7.69	3.32	11.01	.52	1.82	1.67	22.08
7493	12.38	6.83	3.53	10.36	1.10	1.82	1.39	20.96
7494	12.41	7.70	4.21	11.91	.58	1.53	1.33	21.52
7495	11.56	6.65	3.51	10.16	.65	2.24	1.74	22.80
7496	11.04 12.01	7.60 7.47	3.65 3.42	11.25 10.89	.45 .82	1.74 1.80	1.61 1.53	21.95 21.68
		8.00	2.00	10.00	1.00	1.65	1.50	20.13
7497	11.96	6.54	4.05	10.59	.81	2.07	1.54	22.35
7498	10.74	6.90	3.74	10.64	.56	1.89	2.04	22.30
		8.00	2.00	10.00	1.00	1.65	1.50	20.13
7499	2.22						12.38	14.24
7500	1.43						12.14 12.00	13.96 13.80
6319	12.88	10.08	4.71	14.79	1.78			15.80
6726	9.69	10.07	4.16	14.23	2.46			15.24
6727	14.78	10.27	3.72	13.99	1.43			15.02
7501	10.17	9.08	6.09	15.17	1.37			16.08
7502	10.77	8.32	6.20	14.52	2.05			15.35
7503	11.35 11.61	7.62 9.24	4.14 4.84	11.76 14.08	2.58 1.94			12.52 15.00
		9.00	3.00	12.00	2.00			12.90

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
6610	S. G. Royal Acid Phosphate.	Biloxi Milling Co., Biloxi.....
6728	S. G. Royal Acid Phosphate.	Bennett Bros. & McMillin, Louisville.....
7504	S. G. Royal Acid Phosphate.	Winner-Klein & Co., Meridian.....
7505	S. G. Royal Acid Phosphate.	J. Niles Boyd, Kosciusko.....
		Average.....
		Guarantee.....
6387	Scott's H. G. Acid Phosphate	T. S. Turner, Canton.....
6729	Scott's H. G. Acid Phosphate	J. S. Brassfield, Louisville.....
7506	Scott's H. G. Acid Phosphate	Ford Bros. Co., Centreville.....
		Average.....
		Guarantee.....
6611	S. G. Mobile Double Eagle Guano.....	F. W. Locke & Co., Wiggins.....
6730	S. G. Mobile Double Eagle Guano.....	J. P. Meyer, Ellisville.....
7507	S. G. Mobile Double Eagle Guano.....	F. W. Bransby, Macon.....
7508	S. G. Mobile Double Eagle Guano.....	D'Lo Merc. Co., D'Lo.....
7509	S. G. Mobile Double Eagle Guano.....	O. L. Shaw, Ackerman.....
7510	S. G. Mobile Double Eagle Guano.....	Mutual Merc. Co., Utica.....
		Average.....
		Guarantee.....
6612	S. G. Mobile R. B. Am. Superphosphate.....	F. W. Locke & Co., Wiggins.....
6731	S. G. Mobile R. B. Am. Superphosphate.....	Parkman, Byrd & Co., Mt. Olive.....
7091	S. G. Mobile R. B. Am. Superphosphate.....	Wm. Atkinson & McDonald Co., Wess'n.....
7511	S. G. Mobile R. B. Am. Superphosphate.....	S. S. Dale & Sons, Prentiss.....
7512	S. G. Mobile R. B. Am. Superphosphate.....	W. H. Green & Co., Guntown.....
		Average.....
		Guarantee.....
6320	S. G. Mobile Standard Guano	Mott Bros., Union.....
6321	S. G. Mobile Standard Guano	Meyer Bros., Meridian.....
7513	S. G. Mobile Standard Guano	F. W. Bransby, Macon.....
7514	S. G. Mobile Standard Guano	The Green Co., McLain.....
		Average.....
		Guarantee.....
6732	S. G. Royal Blood, Bone and Potash.....	Donald Bros. Merc. Co., New Hebron.....
6733	S. G. Royal Blood, Bone and Potash.....	F. W. Bransby, Macon.....
7515	S. G. Royal Blood, Bone and Potash.....	J. T. Marshall, Eupora.....

Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6610	10.00	10.54	4.49	15.03	1.66			16.08
6728	10.08	8.83	4.37	13.20	3.62			14.08
7504	12.56	7.38	6.51	13.89	1.27			14.63
7505	12.82	8.61	3.89	12.50	1.43			13.36
	11.36	8.84	4.81	13.65	1.99			14.53
		<i>10.00</i>	<i>2.00</i>	<i>12.00</i>	<i>2.00</i>			<i>13.00</i>
6387	13.50	10.50	4.64	15.14	.59			16.19
6729	12.98	11.60	3.82	15.42	1.56			16.58
7506	13.61	9.56	5.84	15.40	.91			16.36
	13.36	10.55	4.77	15.32	1.02			16.38
		<i>12.00</i>	<i>2.00</i>	<i>14.00</i>	<i>2.00</i>			<i>15.20</i>
6611	11.25	6.59	4.33	10.92	1.64	1.54	1.62	20.69
6730	16.08	8.02	3.07	11.09	1.23	1.30	1.09	19.45
7507	14.16	6.83	3.20	10.03	1.32	1.78	1.93	21.06
7508	13.08	6.95	3.40	10.35	1.13	1.72	1.60	20.80
7509	12.57	7.32	3.37	10.69	1.46	1.68	1.40	20.82
7510	11.58	7.45	3.74	11.19	.70	1.76	1.58	21.91
	13.12	7.19	3.52	10.71	1.25	1.63	1.54	20.79
		<i>8.00</i>	<i>2.00</i>	<i>10.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>20.13</i>
6612	12.80	6.74	3.42	10.16	.73	1.81	2.05	21.45
6731	10.60	6.58	4.67	11.25	1.33	1.79	2.56	23.13
7091	13.48	7.87	3.57	11.44	1.03	1.72	1.90	22.44
7511	10.86	5.72	4.90	10.62	.82	1.76	1.87	21.44
7512	11.39	6.37	4.94	11.31	.70	1.74	1.54	21.81
	11.82	6.65	4.30	10.95	.92	1.77	1.98	22.06
		<i>8.00</i>	<i>2.00</i>	<i>10.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>20.13</i>
6320	9.88	5.64	4.01	9.65	2.99	1.62	1.86	19.80
6321	11.05	5.22	4.21	9.43	1.79	1.53	2.79	20.22
7513	10.96	3.66	4.25	7.91	1.93	1.62	2.28	18.17
7514	9.00	5.74	3.47	9.21	1.41	1.52	2.10	19.20
	10.22	5.06	3.99	9.05	2.03	1.57	2.26	19.35
		<i>6.00</i>	<i>2.50</i>	<i>8.50</i>	<i>2.00</i>	<i>1.65</i>	<i>2.00</i>	<i>18.85</i>
6732	11.74	5.91	4.23	10.14	.79	1.53	1.56	19.66
6733	11.88	5.60	4.81	10.41	2.02	1.53	1.55	19.92
7515	11.28	6.84	4.57	11.41	1.83	1.98	1.46	22.83

TABLE II—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and From Whom Collected.
7516	S. G. Royal Blood, Bone and Potash.....	McCullar & Co., Booneville..... Average..... Guarantee.....
7517	S. G. Royal Cot. Boll Guano..	Hawkins, McRaney Co., Bassfield.....
7518	S. G. Royal Cot. Boll Guano..	Barnes & Company, Columbia..... Guarantee.....
7519	S. G. Royal Compound.....	Donald Bros., Magee.....
7520	S. G. Royal Compound.....	Heflin & Topp, Baldwin..... Guarantee.....
6613	H. G. Royal Veg. Fertilizer..	Biloxi Milling Co., Biloxi..... Guarantee.....
6322	S. G. Scott's Gossypium Phospho.....	Winner, Klein & Co., Meridian.....
6388	S. G. Scott's Gossypium Phospho.....	T. S. Turner, Canton.....
6614	S. G. Scott's Gossypium Phospho.....	Winner, Klien & Co., Meridian.....
6734	S. G. Scott's Gossypium Phospho.....	Sid Welch, Shuqualak.....
6735	S. G. Scott's Gossypium Phospho.....	Rouse Bros. & Smith, Poplarville.....
6736	S. G. Scott's Gossypium Phospho.....	J. E. Bounds, Vossburg.....
7522	S. G. Scott's Gossypium Phospho.....	Seward & Fancher, McCool.....
7523	S. G. Scott's Gossypium Phospho.....	W. H. Wood, Pontotoc.....
7524	S. G. Scott's Gossypium Phospho.....	Crawford & Coleman, Noxapater.....
7525	S. G. Scott's Gossypium Phospho.....	W. W. Harris & Sons Co., Iuka.....
7526	S. G. Scott's Gossypium Phospho.....	Floyd Loper, Lake.....
7527	S. G. Scott's Gossypium Phospho.....	McComb City Merc. Co., McComb City
7528	S. G. Scott's Gossypium Phospho.....	Wagner & Co., Water Valley.....
7529	S. G. Scott's Gossypium Phospho.....	O. Hopkins, Hickory..... Average..... Guarantee.....
7530	S. G. V. C. C. Stand. Guano..	F. L. Riley Merc. Co., New Hebron...
7531	S. G. V. C. C. Stand. Guano..	J. T. Marshall, Eupora..... Guarantee.....
	WESSON COTTON OIL & FERTILIZER CO., Wesson, Miss.	
6748	S. G. Mutual Friend Mixt.....	Wesson Cotton Oil & Fert. Co., Wesson
7532	S. G. Mutual Friend Mixt.....	Wesson Cotton Oil & Fert. Co., Wesson Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7516	11.57 11.62	4.62 5.74 <i>8.00</i>	5.64 4.81 <i>2.00</i>	10.26 10.55 <i>10.00</i>	2.34 1.74 <i>2.00</i>	1.67 1.68 <i>1.65</i>	1.29 1.46 <i>1.50</i>	19.91 20.58 <i>20.13</i>
7517	11.19	7.32	4.82	12.14	.74	1.64	1.46	22.33
7518	11.13	4.03 <i>6.00</i>	4.46 <i>2.50</i>	8.49 <i>8.50</i>	.68 <i>2.00</i>	1.96 <i>1.65</i>	2.35 <i>2.00</i>	20.28 <i>18.85</i>
7519	11.31	4.94	7.69	12.63	.84		2.52	17.29
7520	14.94	7.07 <i>8.00</i>	2.32 <i>2.00</i>	9.39 <i>10.00</i>	1.25 <i>2.00</i>		1.92 <i>2.00</i>	13.24 <i>14.10</i>
6613	10.99	5.74 <i>6.00</i>	3.84 <i>2.00</i>	9.58 <i>8.00</i>	2.11 <i>2.00</i>	2.59 <i>2.47</i>	4.94 <i>4.00</i>	27.15 <i>23.88</i>
6322	11.48	6.64	3.64	10.28	.59	2.05	1.74	22.17
6388	12.35	8.23	2.76	11.08	1.06	1.56	1.53	21.02
6614	11.43	6.64	4.12	10.76	.84	1.65	1.61	20.95
6734	13.87	7.47	2.58	10.05	1.38	1.62	1.99	20.57
6735	11.63	8.03	2.87	10.90	1.52	1.58	1.57	20.92
6736	15.14	8.53	3.20	11.73	1.16	1.36	.90	20.23
7522	13.24	7.29	3.12	10.41	.79	1.97	1.78	22.11
7523	13.43	6.28	4.10	10.38	.35	1.79	1.73	21.20
7524	13.88	7.47	3.58	11.05	.35	1.66	1.84	21.66
7525	13.43	7.65	2.98	10.63	.92	1.72	1.75	21.35
7526	9.90	6.36	4.09	10.45	.26	1.99	1.90	22.28
7527	11.46	5.32	4.71	10.03	.38	2.03	1.26	21.13
7528	12.67	6.37	3.76	10.13	.90	1.61	2.13	20.67
7529	11.38 12.45	6.97 7.10 <i>8.00</i>	4.52 3.57 <i>2.00</i>	11.49 10.67 <i>10.00</i>	1.68 .87 <i>2.00</i>	1.45 1.72 <i>1.65</i>	2.04 1.70 <i>1.50</i>	21.48 21.28 <i>20.13</i>
7530	12.42	7.05	3.67	10.72	1.20	1.74	1.53	21.22
7531	13.47	6.19 <i>8.00</i>	5.18 <i>2.00</i>	11.37 <i>10.00</i>	.93 <i>2.00</i>	1.31 <i>1.65</i>	1.19 <i>1.50</i>	19.73 <i>20.13</i>
6748	9.98	6.29	3.00	9.29	.28	1.85	2.40	21.01
7532	11.99	5.23 <i>7.00</i>	3.90 <i>2.00</i>	9.13 <i>9.00</i>	.15 <i>1.00</i>	1.94 <i>1.65</i>	2.07 <i>2.00</i>	20.71 <i>19.50</i>

[illegible]

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6272	S. G. Birmingham Fertilizer	6272	10.64	5.63	3.57	9.20	.57	1.99	2.17	21.14
	Guarantee			7.50	2.00	9.50	2.00	1.64	1.50	19.49
7144	S. G. Monarch Blood and Bone	7144	8.70	6.52	3.79	10.31	2.10	1.48	1.67	19.83
	Guarantee			7.50	2.00	9.50	2.00	1.94	1.50	19.49
6214	S. G. Monarch Boll Buster	6214	9.50	5.16	6.01	11.17	.75		1.46	14.48
	Guarantee			8.00	2.00	10.00	2.00		2.00	14.10
6215	S. G. Monarch Meal Mixture	6215	9.15	6.90	3.17	10.07	.92	1.74	1.67	20.65
	Guarantee			7.50	2.00	9.50	2.00	1.69	1.50	19.49
	BROOKHAVEN PROGRESSIVE COTTON OIL COMPANY, Brookhaven, Miss.									
7042	S. G. Brookhaven Blood and Bone	7042	7.06	5.08	4.51	9.59	1.35	1.98	1.70	20.93
	Guarantee			7.00	1.50	8.50	1.50	1.65	1.60	18.49
6638	H. G. Brookhaven Special Mixture	6638	6.12	6.65	3.99	10.64	.31	1.92	2.63	23.07
	Guarantee			8.00	2.00	10.00	1.00	1.65	2.00	20.70
6345	S. G. New South	6345	6.81	5.85	3.73	9.58	.46	1.67	2.46	20.63
	Guarantee			7.00	2.00	9.00	1.00	1.65	2.00	19.50
	CANTON OIL MILL COMPANY, Canton, Miss.									
6351	H. G. Acid Phosphate	6351	8.89	9.38	5.76	15.14	.60			16.08
	Guarantee			11.00	4.00	15.00	1.00			16.10
6352	S. G. Paragon	6352	6.16	5.65	4.65	10.30	.37	2.49	.66	22.61
	Guarantee			6.60	2.90	9.50	1.05	2.00	.25	19.40
	CAPITAL FERTILIZER & M'F'G. COMPANY, Jackson, Miss.									
6071	H. G. Acid Phosphate	6071	11.06	9.83	4.73	14.56	.61			15.54
	Guarantee			10.00	4.00	14.00	1.00			15.00
6072	S. G. Acid Phosphate	6072	10.83	9.08	4.87	13.95	.38			14.86
	Guarantee			10.00	2.00	12.00	1.00			13.00

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TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
	FEDERAL CHEMICAL COMPANY, Louisville, Ky.									
6182	MARKS & GAYLE, Division Managers, Montgomery, Ala.	6182	15.22	12.64	3.59	16.23	1.16			17.49
	Daybreak Pure H. G. Acid Phosphate No. 2.....			10.67	5.33	16.00	1.00			17.07
6183	Guarantee.....	6183	15.65	12.58	3.62	16.20	1.11			17.46
	Daybreak Pure H. G. Acid Phosphate.....			10.00	4.00	14.00	1.00			15.00
6184	Guarantee.....	6184	13.47	8.01	4.63	12.64	.63			19.25
	Daybreak Pure H. G. Acid Phosphate with Potash No. 3.....			6.67	3.33	10.00	1.00		3.95	16.27
6185	Guarantee.....	6185	11.74	6.56	6.02	12.58	.67		4.00	16.91
	Daybreak S. G. Acid Phosphate with Potash No. 2.....			6.67	3.33	10.00	1.00	1.78	2.00	13.97
6186	Guarantee.....	6186	9.36	7.73	3.03	10.76	1.27	2.73	2.00	22.87
	S. G. Daybreak Fertilizer.....			5.33	2.67	8.00	1.00	1.65	2.00	18.23
6187	Guarantee.....	6187	11.88	11.50	3.02	14.52	.58	.99	2.83	24.34
	Daybreak Fertilizer "AA".....			7.33	3.67	11.00	1.00	.82	2.00	18.41
6188	Guarantee.....	6188	13.45	10.63	3.90	14.53	.50	1.07	2.19	23.84
	Daybreak Fertilizer "AI".....			8.67	4.33	13.00	1.00	.82	2.00	20.75
6189	Guarantee.....	6189	11.83	10.68	2.83	13.51	.50	1.33	3.35	25.10
	H. G. The Complete Fertilizer.....			6.67	3.33	10.00	1.00	1.65	2.00	20.57
6190	Guarantee.....	6190	5.65						11.38	13.09
	S. G. German Kainit.....								12.00	13.80
	Guarantee.....									
	GULFPORT COTTON OIL, FERTILIZER & M'F'G. Co.,									
	Gulphort, Miss.									
6034	Primo H. G. Acid Phosphate 16%.....	6034	10.73	11.40	4.35	15.75	.36			16.89
	Guarantee.....			14.00	2.00	16.00	1.00			17.40
6035	Primo H. G. Acid Phosphate 14%.....	6035	12.18	11.92	1.77	13.69	.38			14.88
	Guarantee.....			12.00	2.00	14.00	1.00			15.20

6036	Primo S. G. Acid Phosphate Guarantee.....	6036	9.75	11.67	2.59	14.26	.63	15.43
6524	Primo S. G. Acid Phosphate and Potash Guarantee.....	6524	13.22	6.36	3.77	10.13	1.00	13.00
6772	Primo H. G. Ammonium Sulphate Guarantee.....	6772	.89	8.00	2.00	10.00	1.51	14.82
6037	Primo H. G. Blood and Bone. Guarantee.....	6037	10.77	7.20	3.07	10.27	20.55	14.10
6038	Primo S. G. Cotton and Corn Guarantee.....	6038	10.81	6.20	.98	7.18	.41	82.20
6039	Primo S. G. Cottonseed Meal Compound Guarantee.....	6039	11.24	6.38	1.43	7.81	1.74	82.00
6040	Primo H. G. Cottonseed Meal Mixture Guarantee.....	6040	12.34	7.00	2.00	9.00	1.65	21.41
6041	Primo H. G. Fruit Tree Special Guarantee.....	6041	11.55	7.22	1.80	9.02	1.00	20.70
6042	Primo H. G. Lawn Mixture.....	6042	5.67	4.06	1.18	5.24	1.13	17.88
6043	Primo H. G. Muriate of Potash Guarantee.....	6043	1.04	5.00	1.00	6.00	1.00	18.30
6044	Primo H. G. Nitrate of Soda Guarantee.....	6044	2.50	3.47	1.20	4.67	1.65	19.16
6045	Primo H. G. Raw Ground Bone Guarantee.....	6045	5.17	4.00	1.00	5.00	1.99	19.50
6046	Primo S. G. R. B. Superphosphate Guarantee.....	6046	9.76	6.20	2.00	8.20	1.65	20.93
6047	Primo H. G. Strawberry Compound Guarantee.....	6047	6.48	7.00	2.00	9.00	1.87	20.70
6048	Primo H. G. Sulphate of Potash Guarantee.....	6048	1.00	3.44	2.18	5.62	2.00	24.30
6049	Primo H. G. Vegetable Fertilizer Guarantee.....	6049	5.45	5.00	1.00	6.00	5.28	28.20
6050	Primo S. G. German Kainit.....	6050	3.59	3.70	1.94	5.64	5.00	58.86
GRASSELLI CHEMICAL Co., Birmingham, Ala.								57.32
7159	Grasselli's H. G. Acid Phosphate Guarantee.....	7159	15.29	10.23	4.07	14.30	3.41	62.00
7160	Grasselli's S. G. Acid Phosphate Guarantee.....	7160	13.33	8.80	3.23	12.03	3.00	23.10
				10.00	2.00	12.00	1.00	22.00
								19.49
								2.37
								19.50
								24.88
								24.85
								58.36
								57.50
								50.00
								5.85
								24.85
								13.53
								13.80
								15.32
								15.20
								12.91
								13.00

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-05.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
7161	Grasselli's S. G. Blood Meal Mixture Guarantee.	7161	13.45	6.38	2.58	8.96	1.71	1.84	1.86	19.99
7162	Grasselli's H. G. Fertilizer Guarantee.	7162	13.31	6.56	2.64	9.20	1.64	2.01	3.02	20.13
6016	HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss. H. G. Acid Phosphate.	6016	12.65	12.77	3.65	16.42	.91	1.65	2.00	22.29
6017	S. G. Imperial Fertilizer Guarantee.	6017	10.55	7.93	3.01	10.94	.90	1.71	2.04	20.70
6018	H. G. Imperial Vegetable Grower Guarantee.	6018	8.20	6.29	2.43	8.72	.90	3.25	1.65	17.70
6019	S. G. German Kainit Guarantee.	6019	3.70	5.00	1.50	6.50	1.00	2.00	12.00	15.20
6254	JACKSON FERTILIZER COMPANY, Jackson, Miss. S. G. Black Hawk Acid Phosphate.	6254	12.29	9.26	4.18	13.44	1.51			14.37
6255	H. G. Acid Phosphate Guarantee.	6255	14.39	11.92	3.96	15.88	1.24			13.00
6256	S. G. Chicago R. B. Superphosphate Guarantee.	6256	9.12	6.09	3.56	9.65	2.62	1.87	2.22	17.07
6257	H. G. Fruit and Vegetable Guarantee.	6257	9.87	4.22	1.94	6.16	.56	1.65	1.50	15.20
6258	S. G. Gulf States Guano Guarantee.	6258	11.78	7.42	2.67	10.09	1.23	3.00	4.00	21.26
6259	S. G. Lampton's R. B. Superphosphate Guarantee.	6259	9.58	5.96	3.76	9.72	2.51	1.65	1.80	19.53
				7.50	2.00	9.50	1.00	1.85	2.32	23.04
				7.50	2.00	9.50	1.00	1.65	1.80	25.04
				7.50	2.00	9.50	1.00	1.65	1.80	23.50
				7.50	2.00	9.50	1.00	1.65	1.80	20.59
				7.50	2.00	9.50	1.00	1.85	2.32	19.87
				7.50	2.00	9.50	1.00	1.65	1.80	21.36
				7.50	2.00	9.50	1.00	1.65	1.80	19.87

6260	H. G. Lotterhos and Huber's Special	6260	8.89	4.39	4.40	8.79	3.70	2.10	4.53	23.72
	Guarantee			6.00	2.00	8.00	1.00	2.40	3.40	22.91
6261	S. G. Royal "C" Brand	6261	11.71	7.45	2.91	10.36		1.65	1.73	20.73
	Guarantee			7.50	2.00	9.50	1.00	1.65	1.80	19.87
6262	H. G. Ground Bone Meal	6262	3.99				21.30	2.79		21.81
	Guarantee						22.90	2.50		21.45
6263	S. G. German Kainit	6263	.70						14.66	16.86
	Guarantee								12.00	13.80
JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.										
7148	S. G. Warrior Ammoniated Potash	7148	12.04	6.03	4.23	10.26	1.39	.78	1.84	17.13
	Guarantee			7.00	3.00	10.00	2.00	.82	1.00	16.13
7149	H. G. Warrior Meal Acid and Potash Mixture	7149	10.61	5.86	4.53	10.39	2.47	1.98	2.97	23.35
	Guarantee			7.00	3.00	10.00	2.00	1.65	2.00	20.60
7150	H. G. Warrior Special Plant Food	7150	11.99	6.87	3.30	10.17	2.01	.79	4.06	19.70
	Guarantee			7.00	3.00	10.00	2.00	.82	3.00	18.39
JEFFERSON GIN & OIL MILL, Harriston, Miss.										
6750	S. G. German Kainit	6750	6.14						13.14	15.11
	Guarantee								12.00	13.80
KOSCIUSKO OIL MILL & FERTILIZER Co., Kosciusko, Miss.										
6528	H. G. Acid Phosphate	6528	10.99	10.78	5.55	16.33	.90			17.41
	Guarantee			11.00	3.00	14.00	1.00			15.10
6529	S. G. Peerless Guano	6529	9.57	7.74	3.62	11.36	.40	1.83	2.29	23.22
	Guarantee			8.00	1.50	9.50	1.00	1.67	1.75	19.94
7185	S. G. German Kainit	7185	2.24						12.96	14.90
	Guarantee								12.00	13.80
LAUREL OIL & FERTILIZER COMPANY, Laurel, Miss.										
6406	H. G. Acid Phosphate	6406	12.35	9.99	4.44	14.43	1.45			15.43
	Guarantee			12.00	2.00	14.00	2.00			15.20
6344	S. G. Acid Phosphate	6344	11.58	9.88	3.90	13.78	1.89			14.77
	Guarantee			10.00	2.00	12.00	3.00			13.00
6360	S. G. K. C. Ammoniated Bone	6360	10.01	6.72	4.32	11.04	1.02	1.19	1.87	19.73
	Guarantee			8.00	2.00	10.00	2.00	1.00	2.00	18.10
6289	S. G. Plow Brand	6289	13.47	6.61	2.92	9.53	1.02	1.87	1.58	20.44
	Guarantee			7.00	2.00	9.00	2.00	1.80	1.50	19.53
6637	S. G. German Kainit	6637	.96						14.04	16.15
	Guarantee								12.00	13.80
LOTTERHOS & HUBER COMPANY, Crystal Springs, Miss.										
6148	Castor Pomace	6148	8.47				2.10	5.69	.99	25.95
	Guarantee						1.50	4.50	.50	19.33

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture — Per Cent.	Phosphoric Acid.				Nitrogen — Per Cent.	Potash — Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6132	MARBACH & LAGAN, Crystal Springs, Miss. Bat Guano	6132	9.20				3.30 5.00	5.77 3.50	1.00 .63	25.37 17.22
7181	Guarantee McMILLAN & HARRISON, Mobile, Ala.	7181	12.44	11.05	4.25	15.30	1.41			16.41
6526	H. G. Acid Phosphate. Guarantee	6526	12.61	5.56 6.00	2.36 2.00	7.95 8.00	.82 1.50	2.28 2.50	2.60 2.50	21.41 22.28
6395	S. G. Perfection Guano. Guarantee P. B. MATHIASON M'F'G. COMPANY, St. Louis, Mo.	6395	8.96	4.55 5.00	5.34 4.00	9.89 9.00	3.66 2.00	2.88 3.00	4.60 4.00	28.14 27.00
6396	H. G. Dissolved Bone. Guarantee	6396	10.00	1.77	5.69	7.46	3.98	2.02	2.22	19.02
6397	S. G. Increscent Brand Arkansas Special Cotton and Corn. Guarantee	6397	8.14	3.00 2.62	5.00 6.79	8.00 9.41	2.00 4.12	1.66 2.77	2.00 1.36	18.04 23.26
	Increscent Brand Southern Special Guarantee			4.00	5.00	9.00	3.00	2.47	2.00	22.48
6399	MERIDIAN FERTILIZER FACTORY, Meridian, Miss. H. G. Meridian Southern Acid Phosphate.	6399	14.93	9.30 12.00	5.05 3.00	14.35 12.40	1.15 1.89			15.28 15.20
6174	Guarantee S. G. Meridian English Acid Phosphate	6174	12.77	9.40 10.00	3.00 2.00	12.40 12.00	1.89 1.00			13.34 13.00
6175	Guarantee S. G. Meridian Blood and Bone	6175	13.85	7.31 8.00	3.56 1.50	10.87 9.50	.87 1.00	1.63 1.65	1.79 1.50	21.27 19.58
7169	Guarantee S. G. Meridian Home Mixture	7169	13.48	6.80 8.00	3.00 1.50	9.80 9.50	1.00 1.00	1.67 1.65	2.06 1.50	20.51 19.58
6176	Guarantee S. G. Meridian Soluble Guano	6176	13.48	6.80 8.00	3.00 1.50	9.80 9.50	1.00 1.00	1.67 1.65	2.06 1.50	20.51 19.58

6177	H. G. Meridian Vegetable Grower	6177	9.68	5.54	2.91	8.45	2.12	2.45	6.20	26.78
	Guarantee			6.00	2.00	8.00	1.00	2.50	5.00	25.15
6279	S. G. Hattiesburg Ammoniated Mixture with Bone	6279	8.77	8.97	2.38	11.35	.27	1.40	1.87	21.13
	Guarantee			8.00	2.00	10.00	1.00	1.65	1.00	19.55
6178	S. G. Meridian German Kainit	6178	4.50						11.64	13.39
	Guarantee								12.00	13.80
	MISSISSIPPI FERTILIZER COMPANY, Jackson, Miss.									
6137	S. G. Acid Phosphate	6137	11.10	9.56	4.41	13.97	.45			14.93
	Guarantee			10.00	2.00	12.00	1.00			13.80
6138	S. G. Horse Shoe Brand	6138	9.75	6.17	3.63	9.80	.28	1.53	2.32	20.19
	Guarantee			7.50	2.00	9.50	1.00	1.65	1.80	19.87
6139	H. G. Miss. Fruit and Vegetable	6139	12.25	4.85	3.07	7.92	.19	2.38	2.49	21.58
	Guarantee			3.00	3.00	6.00	1.00	3.00	4.00	23.50
6140	S. G. Miss. Improved Mixture	6140	10.30	6.28	3.43	9.71	.31	1.54	2.55	20.40
	Guarantee			7.50	2.00	9.00	1.00	1.65	1.80	19.87
6141	S. G. German Kainit	6141	2.09						13.76	15.82
	Guarantee								12.00	13.80
	MR. PLEASANT FERTILIZER COMPANY, Mt. Pleasant, Tenn.									
6152	Big Success H. G. Mt. Pleasant Special Acid Phosphate	6152	8.67	12.70	2.23	14.93	2.59			16.20
	Guarantee			12.00	2.00	14.00	2.00			15.20
6153	S. G. Black Patch Mt. Pleasant Soluble Bone	6153	6.87	11.39	3.41	14.80	3.86			15.94
	Guarantee			10.00	2.00	12.00	3.00			13.00
6154	Big Success S. G. Banner Grain Grower	6154	7.72	6.53	5.44	11.97	7.77		1.94	15.76
	Guarantee			7.00	3.00	10.00	5.00		2.00	14.00
6155	Big Success S. G. Cotton Grower	6155	7.50	6.33	5.51	11.84	6.47	.77	.83	17.57
	Guarantee			7.00	3.00	10.00	5.00	.82	2.00	17.28
6156	H. G. Big Success Black Patch Grain and Seeding Dawn	6156	8.95	7.98	4.71	12.69	3.14	1.84	2.14	24.58
	Guarantee			7.00	3.00	10.00	5.00	1.65	2.00	20.60
6283	S. G. Big Success North Miss. Cotton Grower	6283	12.52	7.50	3.62	11.12	1.98	1.65	1.47	21.27
	Guarantee			7.00	3.00	10.00	5.00	1.64	1.00	19.41
6284	S. G. Big Success White as Snow Cotton Special	6284	10.34	6.01	3.04	9.05	4.63	1.70	2.34	20.05
	Guarantee			6.00	2.00	8.00	5.00	1.65	2.00	18.30
6285	S. G. German Kainit	6285	3.06						11.22	12.90
	Guarantee								12.40	14.26
	NEW ORLEANS ACID & FERTILIZER Co., New Orleans, La.									
5990	H. G. Acid Phosphate	5990	10.35	12.67	4.55	17.22	.51			18.49
	Guarantee			12.00	4.00	16.00	2.00			17.20
5991	S. G. Black Diamond Acid Phosphate	5991	2.62	10.32	4.48	14.80	.45			15.83
	Guarantee			10.00	2.00	12.00	2.00			13.00

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Phosphoric Acid.		Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.							
5992	S. G. Crescent City Acid Phosphate	5992	2.06	7.47	5.93	13.40	.42							14.15
	Guarantee.....			10.00	2.00	12.00	2.00							13.00
5993	S. G. Am. R. B. Superphosphate and Potash	5993	9.22	4.54	5.13	9.67	.28					1.68	1.70	19.51
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
5994	S. G. Blood, Bone and Beef	5994	9.25	4.63	4.87	9.50	.27					1.78	1.64	19.67
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
5995	S. G. Blood, Bone and Potash	5995	9.57	4.45	5.07	9.52	.28					1.94	1.68	20.36
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
5996	S. G. Dissolved Bone and Potash	5996	18.45	4.99	4.56	9.55	.26					1.65	1.50	20.36
	Guarantee.....			8.00	2.00	10.00	2.00					1.91	1.68	18.93
5997	H. G. Economizer	5997	10.00	8.65	2.75	11.40	.23					1.75	2.34	22.75
	Guarantee.....			8.00	2.00	10.00	2.00					1.65	1.50	20.13
5998	S. G. Gold Dust	5998	18.00	7.07	2.13	9.20	.28					1.61	1.70	18.97
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
5999	S. G. Goldsmith's Improved Mixture	5999	18.00	7.09	2.36	9.45	.22					1.66	1.73	19.47
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
6000	S. G. Jack Gaston's Cotton and Corn	6000	18.40	7.01	2.22	9.23	.26					1.66	1.69	19.18
	Guarantee.....			7.00	2.00	9.00	2.00					1.65	1.50	18.93
6001	H. G. Vegetable Grower	6001	17.89	4.41	2.02	6.43	.24					2.44	3.58	20.85
	Guarantee.....			4.00	2.00	6.00	2.00					2.47	4.00	21.48
6002	S. G. German Kaint	6002	3.56											15.76
	Guarantee.....													13.80
6525	H. G. Ground Raw Bone	6525	7.82									3.34	12.80	24.85
	Guarantee.....											3.00		21.00

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NEWTON OIL & M'F'G. COMPANY, Newton, Miss.		7165	6.66	8.96	5.62	14.58	2.56	15.48		
H. G. Acid Phosphate				12.00	2.00	14.00	2.00	15.20		
Guarantee		7166	12.76	10.07	4.24	14.31	1.38	15.32		
G. G. Acid Phosphate				10.00	2.00	12.00	2.00	13.00		
Guarantee		7167	8.46	5.03	3.94	8.97	1.80	20.30		
G. Banner C. & C. Brand				7.00	1.50	8.50	2.00	19.24		
Guarantee		7168	8.09	4.96	4.26	9.22	1.48	20.56		
G. Pine Land Guano				7.00	1.50	8.50	2.00	19.24		
Guarantee										
PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La.										
H. G. Planters Acid Phosphate		6011	4.15	11.03	6.24	17.27	.90	18.37		
Guarantee				12.00	2.00	14.00	2.00	15.20		
G. G. Planters Cotton and Corn No. 1		6012	13.37	6.54	1.63	8.17	.55	17.41		
Guarantee				7.50	2.00	9.50	2.00	16.53		
G. G. Planters Golden Mixture		6013	12.70	6.52	1.63	8.15	.61	17.35		
Guarantee				7.50	2.00	9.50	2.00	16.53		
G. G. Planters R. B. Superphosphate		6014	9.65	5.40	1.76	7.16	.55	15.42		
Guarantee				7.50	2.00	9.50	2.00	16.53		
G. G. Planters German Kainit		6015	5.15					13.71		
Guarantee								12.00		
REFUGE COTTON OIL COMPANY, Columbus, Miss.										
Refuge H. G. Acid Phosphate		7135	11.34	8.65	4.91	13.56	.68	14.43		
Guarantee				12.00	2.00	14.00	2.00	15.20		
G. G. Columbus Home Made Fertilizer		7136	10.34	5.82	3.26	9.08	.56	19.96		
Guarantee				8.00	2.00	10.00	2.00	20.13		
S. G. Refuge Corn Special Fertilizer		7137	10.03	4.57	3.21	7.78	.53	20.56		
Guarantee				5.50	2.50	8.00	2.00	19.89		
S. G. Refuge Standard Guano		7138	10.28	5.02	3.40	8.42	.47	20.19		
Guarantee				6.00	2.50	8.50	2.00	18.85		
SHUBUTA OIL & M'F'G. COMPANY, Shubuta, Miss.										
H. G. Shubuta Acid Phosphate		7152	9.98	9.22	6.38	15.60	.60	16.52		
Guarantee				10.00	4.00	14.00	1.00	15.00		
S. G. Shubuta Mixture		7153	15.52	5.69	3.47	9.16	.86	19.50		
Guarantee				6.00	3.00	9.00	1.00	18.94		
SOUTHERN OIL & FERTILIZER COMPANY, Meridian, Miss.										
H. G. Southern's 20th Century Acid Phosphate		6286	14.91	10.12	3.14	13.26	1.78	14.27		
Guarantee				10.00	4.00	14.00	2.00	15.00		
S. G. Cotton Grower		6287	12.35	7.32	2.34	9.66	1.27	20.58		
Guarantee				6.00	3.00	9.00	1.00	18.25		

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6266	S. G. Southern Superior Guarantee	6266	11.39	7.27 5.00	2.58 3.00	9.85 8.00	1.24 1.00	2.07 1.65	1.44 2.00	21.50 18.20
6523	STANDARD GUANO & CHEMICAL M'F'G. Co., New Orleans, La. H. G. Acid Phosphate 16%	6523	13.79	9.68 14.00	7.65 2.00	17.33 16.00	1.28 1.00			18.30 17.40
6538	Guarantee Stern's H. G. Acid Phosphate 14%	6538	14.14	11.94 12.00	5.16 2.00	17.10 14.00	.86 2.00			18.29 15.20
6539	Guarantee Stern's S. G. Acid Phosphate	6539	13.72	11.81 10.00	5.54 2.00	17.35 12.00	.75 2.00			18.53 13.00
6540	Guarantee S. G. Blood, Bone and Meat	6540	9.14	6.73 7.00	4.32 2.50	11.05 9.50	1.74 1.00	2.42 1.65	2.17 1.50	25.00 19.48
6541	Guarantee S. G. Champion Farmers Choice	6541	8.99	8.21 7.00	3.47 2.50	11.68 9.50	.64 1.00	1.82 1.65	1.28 1.00	22.42 18.90
6542	Guarantee H. G. Dissolved Bone	6542	12.28	15.62 12.00	.68 3.00	16.30 15.00	.10 1.00			17.86 16.20
6211	Guarantee S. G. Ground Bone and Potash	6211	9.28				16.91 15.00	2.89 2.75	3.40 3.00	23.93 21.95
6543	Guarantee S. G. Mississippi Home Guano	6543	14.97	7.13 7.00	2.70 2.50	9.83 9.50	1.60 1.00	1.74 1.65	1.94 1.50	20.72 19.48
6544	Guarantee H. G. Nitrate of Soda	6544	.82					14.81 15.00		59.24 60.00
6545	Guarantee S. G. Pelican R. B. Guano	6545	12.22	6.97 7.00	3.98 2.50	10.95 9.50	1.93 1.00	1.97 1.65	1.57 1.50	22.43 19.48
6546	Guarantee H. G. Pure Raw Ground Bone	6546	7.19				24.32 18.50	2.99 2.50		24.12 19.25

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TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-05.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6065	Swift's Pure H. G. Bone Meal Guarantee	6065	3.95	5.78	3.26	9.04	27.41	2.37	.	23.19
6066	Swift's Red Steer S. G. Guano. Guarantee	6066	6.35	5.50	2.50	8.00	25.00	1.77	2.85	22.46
7039	Swift's S. G. German Kainit Guarantee	7039	1.02				1.50	1.65	2.00	20.45
									12.56	18.25
									12.00	14.44
										13.80
TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.										
6531	Ox H. G. Dissolved Bone Guarantee	6531	10.41	9.52	7.67	17.19	1.60			18.14
6532	Ox H. G. Ammoniated Bone Guarantee	6532	13.56	8.00	6.00	14.00	1.00	1.70	2.50	14.80
6533	Ox S. G. Cotton Guano Guarantee	6533	13.99	7.00	3.00	10.00	1.00	1.65	2.00	22.68
6534	Ox S. G. Potash Mixture Guarantee	6534	12.12	6.43	4.76	11.19	.40	1.67	1.18	20.99
6535	Ox S. G. Slaughter House Bone Guarantee	6535	11.85	6.00	4.00	10.00	1.00	1.65	1.00	19.35
				4.03	6.81	10.84	.47		2.20	14.86
				4.77	4.69	9.46	.37	1.65	2.11	13.90
				5.00	3.00	8.00	1.00	1.65	2.00	19.91
										18.20
TENNESSEE VALLEY FERTILIZER COMPANY, Florence, Ala.										
6159	S. G. Dissolved Bone Guarantee	6159	11.80	6.75	3.76	10.51	7.91			11.19
6160	H. G. Tiger Dissolved Bone Guarantee	6160	14.72	10.00	2.00	12.00	2.00			13.00
6161	S. G. Ashcroft's Formula Guarantee	6161	12.35	8.72	4.63	13.35	2.75			14.22
				12.00	2.00	14.00	2.00			15.20
				6.20	3.93	10.13	1.75	3.53		15.29
				8.45	2.00	10.45	1.55	2.19		14.86

6162	H. G. Florence Fertilizer..... Guarantee.....	6162	13.39	5.24	2.44	7.68	2.41	1.77	2.92	18.97
6163	S. G. King Cotton Grower..... Guarantee.....	6163	12.50	4.73 7.00	2.80 2.00	7.53 9.00	1.68 2.00	1.56 1.65	2.71 1.00	20.70 18.11 18.35
THREEFOOT BROS. & COMPANY, Meridian, Miss.										
6400	Threefoot's H. G. English Acid Phosphate..... Guarantee.....	6400	13.87	8.88 13.00	6.68 2.00	15.56 15.00	1.11 1.00			16.45 16.30
6401	Threefoot's S. G. Prolific Acid Phosphate..... Guarantee.....	6401	9.63	10.50 11.00	5.17 2.00	15.67 13.00	.70 1.00			16.72 14.10
6402	S. G. Threefoot's Improved Mixture..... Guarantee.....	6402	12.24	6.40 7.50	3.44 2.00	9.84 9.50	.69 1.00	1.83 1.64	1.55 1.60	20.57 19.60
TUPELO FERTILIZER FACTORY, Tupelo, Miss.										
7140	H. G. Cotton Belt Acid Phosphate..... Guarantee.....	7140	16.55	10.45 12.00	3.90 2.00	14.35 14.00	1.18 2.00			15.40 15.20
7141	H. G. Cotton Belt Vegetable Producer..... Guarantee.....	7141	11.03	4.68 4.00	2.74 2.00	7.42 6.00	.63 1.00	2.38 2.47	5.16 5.00	24.08 22.63
7143	S. G. Tupelo German Kainit..... Guarantee.....	7143	2.11						13.84 12.00	15.92 13.80
VIRGINIA-CAROLINA CHEMICAL COMPANY, Memphis, Tenn.										
6108	S. G. I. X. L. Acid Phosphate..... Guarantee.....	6108	9.33	10.61 9.00	3.82 3.00	14.43 12.00	3.16 2.00			15.49 12.90
6109	S. G. Royal Acid Phosphate..... Guarantee.....	6109	8.85	10.72 10.00	3.63 2.00	14.35 12.00	3.25 2.00			15.42 13.00
6640	H. G. Royal Dissolved Bone..... Guarantee.....	6640	12.57	11.07 12.00	4.36 2.00	15.43 14.00	1.73 2.00			16.54 15.20
6110	Scott's H. G. Acid Phosphate..... Guarantee.....	6110	11.40	11.78 12.00	3.86 2.00	15.64 14.00	1.87 2.00			16.82 15.20
6293	H. G. Virginia-Carolina Superphosphate..... Guarantee.....	6293	10.76	11.94 12.00	5.98 4.00	17.92 16.00	.24 2.00			19.11 17.20
6527	S. G. Buck's Best..... Guarantee.....	6527	10.83	7.13 8.00	3.62 2.00	10.75 10.00	.18 2.00	1.98 1.65	2.09 1.50	22.86 20.13
6639	S. G. Eclipse Soluble Guano..... Guarantee.....	6639	9.86	5.33 7.50	4.94 2.00	10.27 9.50	3.02 2.00	1.80 1.65	1.14 1.00	20.34 18.95
6202	H. G. Memphis Truck Special..... Guarantee.....	6202	13.65	4.64 5.00	3.21 3.75	7.85 10.81	.99 2.00	2.51 3.30	4.24 4.00	24.02 26.00
6111	S. G. Mobile Double Eagle Guano..... Guarantee.....	6111	10.71	7.06 8.00	3.75 2.00	10.81 10.00	.26 2.00	1.94 1.65	2.03 1.50	22.39 20.13

TABLE III—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1906-07.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
6112	S. G. Mobile R. B. Ammoniated Superphosphate. Guarantee	6112	11.14	6.74	3.53	10.27	2.65	1.66	1.67	20.28
6149	S. G. Mobile Standard Guano Guarantee	6149	7.20	8.00	6.01	10.00	2.00	1.65	1.50	20.13
6113	S. G. Royal Blood, Bone and Potash. Guarantee	6113	10.36	6.00	2.50	9.72	2.96	1.66	2.34	20.27
6150	S. G. Royal Cotton Boll Guano. Guarantee	6150	8.20	6.78	3.87	10.65	2.05	1.79	1.75	21.30
6114	S. G. Royal Compound. Guarantee	6114	14.71	6.00	2.00	10.00	2.00	1.65	1.50	20.13
6115	H. G. Royal Vegetable Fertilizer. Guarantee	6115	9.72	6.13	3.03	9.16	2.90	2.56	4.15	25.08
6116	S. G. Scott's Gossypium Phospho Guarantee	6116	10.13	7.11	3.57	10.68	2.8	2.47	4.00	23.88
6265	H. G. Scott's Potasso Phospho Guarantee	6265	13.67	8.00	2.00	10.00	2.00	1.95	2.05	22.31
6151	S. G. Scott's State Standard Guano. Guarantee	6151	7.55	7.38	5.71	13.09	.50	1.65	1.50	20.13
6117	S. G. V. C. C. Standard Guano Guarantee	6117	11.10	9.00	3.00	12.00	2.00	2.15	2.00	17.61
6118	S. G. German Kainit. Guarantee	6118	.90	6.51	3.48	9.99	.18	1.93	2.37	21.73
6556	WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss. S. G. Mutual Friend Mixture. Guarantee	6556	10.16	7.00	2.00	8.50	2.00	1.65	2.06	22.50
				8.00	2.00	10.74	2.00	1.65	1.50	20.13
						10.00		12.64	14.54	13.80
								12.00	1.68	21.70
								1.65	2.00	19.50

Mississippi Agricultural Experiment Station

BULLETIN NO. 106.

JANUARY, 1907.

REPORT OF WORK AT THE DELTA STATION FOR 1906.

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BY J. W. FOX.

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### INTRODUCTION.

The station is located at Stoneville, nine miles east of Greenville, on both the Y. & M. V. and Southern railroads. It contains 250 acres—210 acres in cultivation. About two-thirds of the place is sandy loam soil immediately on Deer Creek, the remainder being stiff clay, commonly known as "buck shot." The place was poorly drained, about thirty acres not having been worked for years, on this account. On account of its accessibility, and also because of its variety of soil, the Station was wisely located. Washington county gave 200 acres of the land and the State bought 50 acres adjoining.

Quite a lot of preliminary work had to be done during this year, such as buildings (there being nothing in the way of buildings on the place except a few dilapidated cabins), fencing, ditching and freeing the land of stumps and grubs.

### IMPROVEMENTS.

**Buildings.**—We have built a manager's cottage of five rooms, five cabins, barn to house all stock, forage and implements. The entire farm has been fenced with hog proof fencing, twenty inch woven wire at bottom and three strands of barb wire above.

**Drainage.**—The farm has been surface drained with broad shallow ditches, made either with a two-horse road machine or drag road scraper. The rows run out into these ditches which quickly carry the water off,

while they occupy very little ground, being used as turn rows. They are so constructed that a team can cross them or turn in them at any point.

Ditches should never be made with spade and shovel for two very good reasons: first, this method is too expensive; and, second, the dirt must be put in the wrong place, and, consequently, water cannot get into the drains.

Every large plantation should have both a standard and a small two horse road machine, and small farms should have a two-horse machine; both should be supplied with drag road scrapers. With these implements and with good teams and intelligent supervision, drainage in the Delta is really an easy proposition because there is generally at hand a natural outlet and a sufficient fall. There are some sections that should form drainage districts to secure outlets; this is being done in some localities under the present law and this question will receive more attention in the near future.

We expect to tile drain about sixty acres of the Station during the year 1907 and will report on this in due time.

### COTTON.

The object of the work with cotton is to keep up with the best varieties and improve, by careful selection, such as are suitable to Delta conditions; to compare, as to profitable return, different length of staple; to report on cultural methods, which includes width of rows and distance in rows, time to plant, and methods of preparation and cultivation; fertilizers, the kind and quantity to be used, and how to apply.

**Varieties.**—We grew this year sixteen varieties, varying in length from short upland to staple cotton. Classifying them according to length of staple, the two best varieties of each class were as follows: Short Upland (1" staple), Cook's Improved and Moss' Improved, average yield of lint cotton per acre, 560 pounds; Bender's (1 1-8"

staple); Triumph and Lewis Prize Prolific, average yield per acre, 550 pounds; 1 3-16" to 1 1-4" staple—Southern Hope and Black Rattler—average yield, 350 pounds; Staple Cotton (1 3-8" to 1 1-2" staple), Sunflower and Allen—average yield, 340 pounds. On the basis of 10c for short cotton and 10 $\frac{3}{4}$ c for 1 1-8" staple, which is about the usual premium for this length, the lint from the latter variety would be worth \$59.66. In order for the staple cotton to bring the same price, per acre, it would have to sell for 17 8-17 cents per pound. The above figures will serve better as a comparison of lengths of staple than of individual varieties, as we did not have a number of excellent varieties suitable to Delta conditions that should have been in the list.

Gathering the crop is a factor in cotton production that must be reckoned with, especially in the Delta; therefore, a big boll variety, other things being equal, is preferable. We are working with and improving several excellent big boll varieties of different lengths which will be reported on later.

**Spacing.**—Cotton on good land is frequently left too thick, either in the row or drill; rarely is the opposite mistake made. The proper distance depends so much on circumstances that it is difficult to make any definite statement concerning the subject. We found that on old Delta land, which with an application of from 300 to 500 pounds of cottonseed meal per acre made approximately a bale of cotton, that rows four feet apart and two feet in the drill gave the best results. However, there are some varieties that require more distance than others, and the proper distance will also depend on the season to some extent. The above test was made with a variety that is not a rank grower and we had a moderately dry season. My observation leads to the conclusion that the yield in the Delta is lessened by too close spacing.

**Cultural Methods.**—Cotton needs the same thoroughly prepared seed bed as does any other crop and the same thorough but shallow cultivation after the froots get out in the row. Perhaps the greatest mistake, and the one most universally made in cotton cultivation, is deep plowing, which tears and exposes the roots after the plants get



large. This causes the August shedding about which there is so much complaint. It matters little how the plant is cultivated when it is little if the grass is killed; but after the roots get out into the middle only shallow cultivation should be given; this should be frequent and should continue until bolls begin to form.

### FERTILIZERS.

There is quite a demand for information concerning the use of commercial fertilizers on the old lands of the Delta; in view of this fact, we tried different kinds of fertilizers in different combinations and amounts with both cotton and corn. Our results during the season of 1906 indicated that the only fertilizing element needed here is nitrogen and that this can be applied to the light lands under cotton very profitably. We got no increase of yield from the use of either phosphoric acid or potash when applied to cotton, corn or cowpeas. Nitrogen in the form of dried blood or cottonseed meal made a very material increase in all crops to which it was applied on light land. The stiff land did not respond so readily to this fertilizer. 450 pounds of cottonseed meal per acre increased the yield of seed cotton from 960 pounds to 1500 pounds.

While each test made during the year points strongly to the result as stated above, that this soil is abundantly supplied with the mineral fertilizing elements, it must be understood that one year's work does not definitely settle such an important matter and the test will be very carefully repeated each year. If it is true, as indicated, that even the old lands that have been cropped in cotton for forty years lack only nitrogen to be supplied with all necessary fertilizing elements, the fact should enhance the value of these lands, since the problem of keeping them fertile is much simplified. The growing of one crop of cow peas (which grow here most luxuriantly) in corn would supply nitrogen enough for two crops of cotton. If, then, one third of the land could be put in corn and peas each year the only cost of keeping the land fertile would be the seed peas. If this rotation could not be followed, cottonseed meal could be used.

The great advantage of growing the peas would be the cheapness of the plan, and principally on account of the humus added by the pea vines and corn stalks, and hence, the better mechanical condition of the soil. Alfalfa and red clover both supply nitrogen in abundance.

### FORAGE CROPS.

**Alfalfa.**—Alfalfa is growing nicely on the stiff clay land of the Station. We cut this year from alfalfa sown last fall, 6,300 pounds of hay per acre. The stand will be thicker and a better yield will be secured the second year. This alfalfa needed no artificial inoculation. While alfalfa has been successfully grown on all of the stiff or buck-shot lands where tried it has not done well on the light sandy lands. We are trying a piece of alfalfa on this character of soil, inoculating a part of it with soil taken from the old alfalfa field. This inoculated patch is growing nicely and the experiment promises to be successful.

**Red Clover.**—Red clover made 5,800 pounds of hay per acre. It is growing well both on the stiff and light soil.

**Oats.**—Fall sown oats made 5,200 pounds of excellent hay. They were cut in the dough stage. Red Rust Proof is the variety best suited to our section. Peas planted in drills thirty inches apart, after oats were cut made 3,500 pounds of hay per acre. This combination of fall sown oats followed by cowpeas is a good one for the Delta farmer who has had the bitter experience of making a cotton crop on timothy hay that cost him from \$20.00 to \$24.00 per ton.

**Wheat.**—Wheat grew well without smut or rust or any unfavorable condition. It makes a most excellent feed when cut when just coming into the dough stage.

The Delta seems to be particularly adapted to the successful growing of forage crops.

### CORN.

We made an average yield of 41 bushels per acre on the entire crop under ordinary field conditions. When it is remembered that this

land has been cropped in cotton for years without any restorative crop or fertilizer of any kind, this will be considered a fair crop and will refute the statement sometimes heard that the Delta is not a good corn section. This erroneous idea originated from the fact that cotton in the Delta is a jealous mistress and permits little attention from the planter to corn, hay or any other crop.

**Varieties.**—Northern grown seed is generally grown here, which is another reason for a small yield. While it is true that the north central states have very excellent varieties of corn, they are not adapted to this section, will not yield as much corn, will not yield as sound corn and the corn weevils are much more destructive in early northern corn.

What our farmers should do is to select some good Southern variety of corn, such as Mosby, Cocke's Prolific, Saunders, Weekley's Improved, etc., and improve this variety from year to year by careful selection made from the field. Delta planters are proverbially careless in the matter of varieties of planting seed, both in corn and cotton. I have no doubt that often the difference in yield from good to poor varieties of cotton, means the difference between profit and loss in the year's business.

### HOGS.

Eight brood sows bred to farrow in March were bought in February. These with their pigs were turned into a red clover pasture of  $3\frac{1}{2}$  acres March 20th, the red clover having been sown the previous fall. This furnished ample grazing for the bunch until August 20th, when they were turned into a  $4\frac{1}{2}$  acre lot planted to early corn and peas. About one-half of the corn was blown down by a severe storm and wrapped up by the heavy growth of vines; this was left in the field for the hogs to gather. The bunch of thirty pigs was killed out of this field without the addition of any other feed. They weighed dressed, an average of 117 pounds at an average age of 196 days, and were sold to local butchers for 8c per pound. Approximating the amount of damaged corn left in the field and counting the peas a by-product,



which should be grown anyway to improve the land, the pigs ate approximately six bushels of corn at 60c per bushel. Counting land rent at \$5.00 per acre, and also counting the cost of seeding the red clover, they cost \$4.38 each and brought \$9.36 each on November 1st. The sows with their fall litters were turned into  $3\frac{1}{2}$  acres of dwarf Essex rape seeded August 22d on the red clover lot mentioned above. This will furnish grazing for them until alfalfa or red clover is ready in the spring.

This combination, red clover or alfalfa for late spring and summer and early fall, and rape for late fall, winter and early spring, will furnish excellent pasturage for our hogs for the entire year.

We have had no disease among the hogs and they are in a thrifty condition today. We do not have the menace of hog cholera to the extent that it exists in some sections because of the fact that few hogs are brought into this section and therefore contagious diseases are not spread.

I regard the Delta as a good place to raise hogs and believe that the planters that own and live on their own farms can profitably raise their meat as well as all their feed.



# Mississippi Agricultural Experiment Station.

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BULLETIN 107.

REVISED EDITION.

FEBRUARY, 1909.

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## PORK PRODUCTION AT THE DELTA STATION.

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BY J. W. FOX.

INTRODUCTION.

It is our purpose in this circular, to report briefly, but in detail, the work with hogs at the Delta Station during the year. It is not expected that this report will add materially to the numerous careful feeding experiments reported from the different Stations; but as we have raised and marketed a bunch of one hundred and twenty-two pigs, under ordinary farm conditions, at a nice profit, and as all details of the management are given, and also the pasture rotation, which furnished grazing every day in the year, it is hoped that our farmers will get some useful information as to details of management and suitable pasture crops that will be of material help.

RESULTS.

We marketed during October, November, and December one hundred and twenty-two pigs, receiving for the lot \$1,382.50. They were the produce of ten sows, farrowing two litters a year. The fall pigs were farrowed from September 20th, to October 10th, and the spring litters from March 18th, to April 22nd. They were marketed at an average age of about ten months. Thirty-two were sold on foot and averaged 175 1-2 pounds. Eighty-five were dressed and averaged 135 3-8 pounds.

The financial statement showing proceeds of sale, cost of production, and net profit, is as follows:

32 pigs, average live weight 175 1-2 pounds, at 6c.....	\$ 336.90
85 pigs, average dressed weight 135 3-8 pounds, at 8c.....	920.50
5 gilts, sold for breeding purposes, at \$25.00.....	125.00

Total proceeds.....	\$1,382.50
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EXPENSES.

265 bushels of corn at 70c.....	\$ 185.50
260 bushels of corn (estimated) at 65c.....	169.00
3 tons of shorts at \$25.00.....	75.00
Rent on 13 1-2 acres of land at \$6.00.....	81.00
Seed used on pasture lots.....	29.50
Preparing and seeding pasture lots	39.50

Total expense.....	\$ 579.50
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Net profit.....	\$ 803.00
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If the five gilts, which averaged 196 pounds,

had been sold at 6c, net profit would have been.....	\$ 736.80
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The corn in the above expense account, which is estimated, was grown on thirteen acres of land after a crop of oats had been harvested. Peas were planted in the corn, and the hogs were turned in the field in the fall, eating the peas and corn together. In order to get the peas planted in time to mature, the corn was given only one working and twenty bushels per acre is a fair estimate of the yield.

MANAGEMENT OF HERD.

The boar is kept in a separate lot, and the sows are bred to farrow in the spring and fall. The litters should be as near the same age as possible, as they can be handled and fed together to better advantage.

Each sow has a separate stall, six by eight feet, with a small lot adjoining. A few days before farrowing the sow is placed in the house, with access to the lot, and kept there until the pigs are about two weeks old; the gate is then left open and the sow and pigs go out to pasture at will, using the house as a sleeping quarter.

A box of hard-wood ashes and salt is kept in a dry place, accessible to the hogs at all times. No medicine nor stock food is used,

but regular attention is given to keep the herd free from lice. This we consider very important, as young pigs will not thrive when infested with lice. A cheap soap is stirred in boiling water, and to two gallons of this mixture one quart of kerosene oil is added. This is applied with an old broom as often as is necessary. In addition, a little kerosene oil is sprinkled on the floor of the sleeping quarters when cleaned.

Another important detail of the management is to keep the sleeping places free from dust. The houses have plank floors, and these are swept at regular intervals.

The actual work required to care for the hogs was small. The careful attention to details at the proper time is the important thing necessary.

PASTURES.

Our pasture rotation, which furnishes grazing all the year, consists first of a Bermuda lot in which the houses are located, and which contains shade and water. If a mixture of Burr and White clover is sown on the sod in the fall, this part of the pasture will be greatly improved.

Opening from this are three lots of four and a half acres each; two of these are seeded to Dwarf Essex rape and Red clover early in September. The other lot is planted in wheat and vetch in September or October. The wheat lot is plowed in April and planted in sorghum in drills and cultivated.

In addition to these pastures, every acre of corn is planted in peas, very thick, at the last working of the corn, and the entire field is fenced to permit the grazing of the pea field after the corn is harvested.

The rape will be ready to graze in thirty to forty days after seeding and will furnish grazing all winter. When the rape is gone in the spring, the clover, sown with it in the same lot, will furnish grazing until the latter part of July, when the hogs can be turned into the sorghum lot.

Six pounds of rape and ten pounds of clover seed, per acre, should be sown. The land must be plowed some time before seeding and kept well disced and harrowed. Prepare seed bed as for turnips and cover with a smoothing harrow.

The Orange variety, or a similar kind, of sorghum should be grown, as the stalks grow larger and contain more nutriment than the Amber. Two plantings of sorghum should be made, one very

early in April, the other about three weeks later. Turn hogs on when the heads are beginning to turn brown on the early planting.

One-half bushel each of wheat and Hairy vetch should be sown together, and this lot should be seeded as early in the fall as possible.

The hogs should have access to both the rape and wheat lots during the winter, as they like a variety. If the wheat and vetch lot is not kept grazed down by the hogs, other stock may be turned in when the ground is dry.

We wish to urge the necessity of plowing early, and, of keeping well disced and harrowed, land that is to be planted to fall crops. Not only is this necessary for a good seed bed, but, owing to our dry falls, sufficient moisture to germinate the seed will not be available unless this plan is followed.

We also urge that rape be planted on rich land, or that it be made rich by a liberal application of stable manure. Rape will not grow successfully on poor land.

The above rotation is suitable to the Yazoo-Mississippi Delta and similar alluvial lands of our State which grow red clover. It will, we think, be successful in the prairie section of the state. Where alfalfa is being grown for hay, the meadows may also be used as a hog pasture, provided too many are not turned in. In other words, the alfalfa should be considered primarily as a hay crop and incidentally as a hog pasture.

For the hill section of the state, we suggest that two lots be sown to wheat and vetch and one to rape, the rape lot to be plowed in the spring and planted in sorghum. If these lots are not grazed too early, the wheat will mature, the hogs preferring the vetch after the wheat begins to joint, and the grain will furnish good feed. A beardless variety of wheat should be planted.

We again insist that the rape must be planted on rich, well prepared land. This plant is not particular about the character of land on which it grows, provided the land is rich.

FEEDING.

The sows are fed a little shorts in addition to corn, after farrowing, while they are kept in the farrowing pens. After two weeks they are turned back into pasture and are fed corn only. The pigs are fed corn and shorts as soon as they will eat, the shorts being fed until the pigs are about three months old, each pig getting about fifty pounds.

They are also fed liberally of corn while small, the idea being to give them a vigorous start that they may make good use of the pasture, which, after all, is the cheapest factor in pork production.

Up to the time the pigs were turned into the pea field in September to be fattened, they had eaten an average of 122 pounds of corn and fifty pounds of shorts each. From September until they were sold, they had the peas from a corn field of fifty-three acres (except eighty bushels picked for seed) and thirteen acres of corn, planted after oats, estimated, as stated above, at two hundred and sixty bushels. The peas and corn were harvested by the hogs, which method saved labor and left the manure where it was needed.

The above statement of feed consumed included what the sows ate.

HOUSES AND FENCES.

The houses consist of a row of stalls, six by eight feet, six feet high on the front and four feet on the back, floored. They were built by the farm hands out of cheap lumber, and are inexpensive but are sufficient for this climate. The small lots are fenced with one by six plank. The pasture fence consists of woven wire below and barbed wire above. In order to have a good wire fence, the corner posts must be large, set deep in the ground, and well braced. The wire should then be stretched tight, very tight. The best time to stretch wire is in the summer on a hot day. If put up in winter in cold weather, it will become somewhat slack in hot weather. The best adjunct of the fencing proposition is a good pasture on the inside.

We do not ring the hogs. It has been our experience that hogs kept on pasture all the time will do very little damage by rooting.

BREEDS.

In respect to the superiority of the different breeds, we do not advise, not having made any comparative tests. We are using Berkshires, the boar and most of the sows being pure bred.

It will be noticed, by referring to the figures given above, that the market weights of the hogs were light for the age; but the amount of grain fed the pigs up to the time they were turned into the pea field to be fattened was also small. It is an open question whether it would have been more profitable to have fed more grain on pasture. We intend to test this next year by growing larger hogs at a greater cost, and will report the results in due time.

VALUE OF COWPEAS IN THE CORN FIELD.

We wish to call particular attention to the importance of a pea field, planted in corn at the last working, as a factor in cheap pork production. We made an experiment last fall to determine the value of such a pasture, the result of which should be very gratifying to Southern farmers, who have a monopoly on such a pasture. The Northern farmer cannot grow peas planted in corn, but must give them the use of the land during the entire growing season.

After the corn was gathered, fifty-one spring pigs were turned into the pea field of seventeen acres. They had no additional feed. The gain made from the peas was 2893 pounds, or 170 pounds per acre. At 6c per pound, this gives a value for the peas of \$10.20 per acre. And this is net, as the hogs did their own harvesting. Also the manure and humus from stalks, vines and seed were left on the land. By tests made at the Station for two years to determine the value of peas grown in corn, as a fertilizer, it has been found that they increase the succeeding cotton crop by 110 pounds of lint per acre. The land used was old and had been cropped continuously in cotton. A prolific short variety of cotton was used in the test. Figuring the increase at 9c per pound, the peas had a fertilizing value of \$9.90 per acre. The above eloquently suggests a means of improving our lands, worn by a one-crop system, at a profit instead of an expense.

The fertilizing value of peas will not be so great as this on the hill lands, which are deficient in phosphorus, but they must be relied on there to largely supply the nitrogen, while the phosphorus must be supplied.

On our Delta lands, the supply of phosphorus and of potash seems to be abundant, hence the wonderful effect of the peas.

After all, the question of richer lands is the biggest problem that confronts the Mississippi farmer, and the hog is not to be overlooked in its economical solution.

SUMMARY.

Some of the important features of the work which contributed to our profit may be recalled:

First. At farrowing time the sows were separated and given comfortable quarters, and the young pigs were given extra attention.

Second. The herd was kept free from lice, and were not allowed to sleep in dusty beds.

Third. Good pastures were provided all the year, thus insuring large, strong litters, and a healthy herd, and also cheap pork.

Fourth. The farm is fenced, making it possible to fatten the hogs largely on peas planted in the corn as a catch crop for fertilizing purposes. This crop gives the South a distinct advantage over other sections, and this feature of the work cannot be too strongly urged. The fact that the peas can be converted into money without any cost of harvesting should add an additional incentive to grow more corn and peas and thus improve the land, handle the farm with less labor, and keep the cotton money at home. We are blessed by being able to raise cotton, the greatest staple money crop of any section. Let us make the most of this privilege by raising our hay, corn and hogs, in order that our cotton money may be our own.

The Delta Station asks that more consideration be given the Mississippi hog.

Mississippi Agricultural Experiment Station.

BULLETIN No. 108.

REPORT OF WORK AT HOLLY SPRINGS
BRANCH EXPERIMENT STATION, 1906.

C. T. AMES.



FIG. 1.—Showing character of erosion at Holly Springs and in the Brown-loam area.

AGRICULTURAL COLLEGE, MISSISSIPPI.

JANUARY, 1907.

Report of Work at the Holly Springs

Branch Experiment Station for 1906.

Lying between the Yazoo-Mississippi Delta on the West and the Flat Woods and Pontotoc Ridge on the east is an area with a silt soil overlying sand and gravel. It is a rolling and sometimes hilly section. The soil has a brown color on the west and a yellowish tinge on the east. The silty surface soil doubtless belongs to the Loess formation.

The Legislature provided for a branch experiment station for the northwestern part of the state to be located on the Brownloam area referred to above. In accordance with this Act of the Legislature the Station was located adjoining the town of Holly Springs between the Frisco and Illinois Central Railroads.

The Station owns 200 acres of land which has been in cultivation for more than half a century and had been allowed to wash badly so that the productiveness had been reduced to almost nothing. A narrow valley winds through the farm and gives about 15 acres of good soil, the balance being poor, washed, and gullied hill land. Fig. 1 gives some idea of the character of the erosion.

The conditions obtaining in the Brownloam area—the light silt soil and the sandy foundation—are peculiarly favorable to easy and excessive erosion and during the half century or more that these lands have been in cultivation, the erosion has been most extensive and appalling. Originally these soils were very productive and the country most attractive to settlers, but the extent and character of the erosion now forms the feature of the landscape. The Holly Springs Station will endeavor to obtain information that will be useful and helpful in handling this section of the state.

The Legislature of 1904 appropriated \$3,000.00 for a branch station for this section so that the Holly Springs Station began its preliminary work in January, 1905. Mr. R. S. Wilson managed the affairs of the Station during that year. His efforts were directed largely to filling the smaller washes and gullies, terracing, and fencing but most of the farm was also planted to some crop. Half the farm was planted in cowpeas. These failed to make very much growth except a few spots where the soil was fairly good. A small orchard was put out, about five acres planted in strawberries and some plot work with cotton, corn, and grasses was also done.

The plat work was done on a comparatively level but very unproductive piece of land and the demand for nitrogenous fertilization was so great as to completely overshadow other things—phosphates increased the yield of cowpeas to a marked degree.

Just as these lands wash easily, so it is easy and inexpensive to fill the smaller gullies and washes. The Station farm was made to appear entirely a different thing by the expenditure, for labor, of \$118.25 for cutting bushes and grubbing roots; and, \$40.10 for labor in filling gullies and washes.

The Legislature of 1906 not only provided for the support of the Station for two years, but also for certain buildings and repairs and live stock. The Normal School building, given by the State for a Station residence, has been repaired as per appropriation providing for same. The barn has been built and the work with chickens and cabins will be begun as early as possible.

The herd of beef cattle was purchased as soon as the appropriation for same was available.

The work of completing the fences was done, more gullies filled and more terraces made and the regular systematic work of the Station planned and put into operation.

To prevent washing.—Anything that will hold the soil in place such as a sod of bermuda or a sod of lespedeza is excellent; and any device that will control the running water so as to make it move slowly is more or less helpful and satisfactory.

Three methods of terracing land have been developed with a view to prevent washing. One is to have a system of level embankments about four feet wide and eighteen inches high. The rows to be run as near on a level as possible and parallel to the embankments. This method is employed where both the surface and subsoil are porous and absorb water rapidly. Fig. 2 shows how a hillside may be handled by this method. It aims at holding the water practically where it falls until it soaks into the soil.

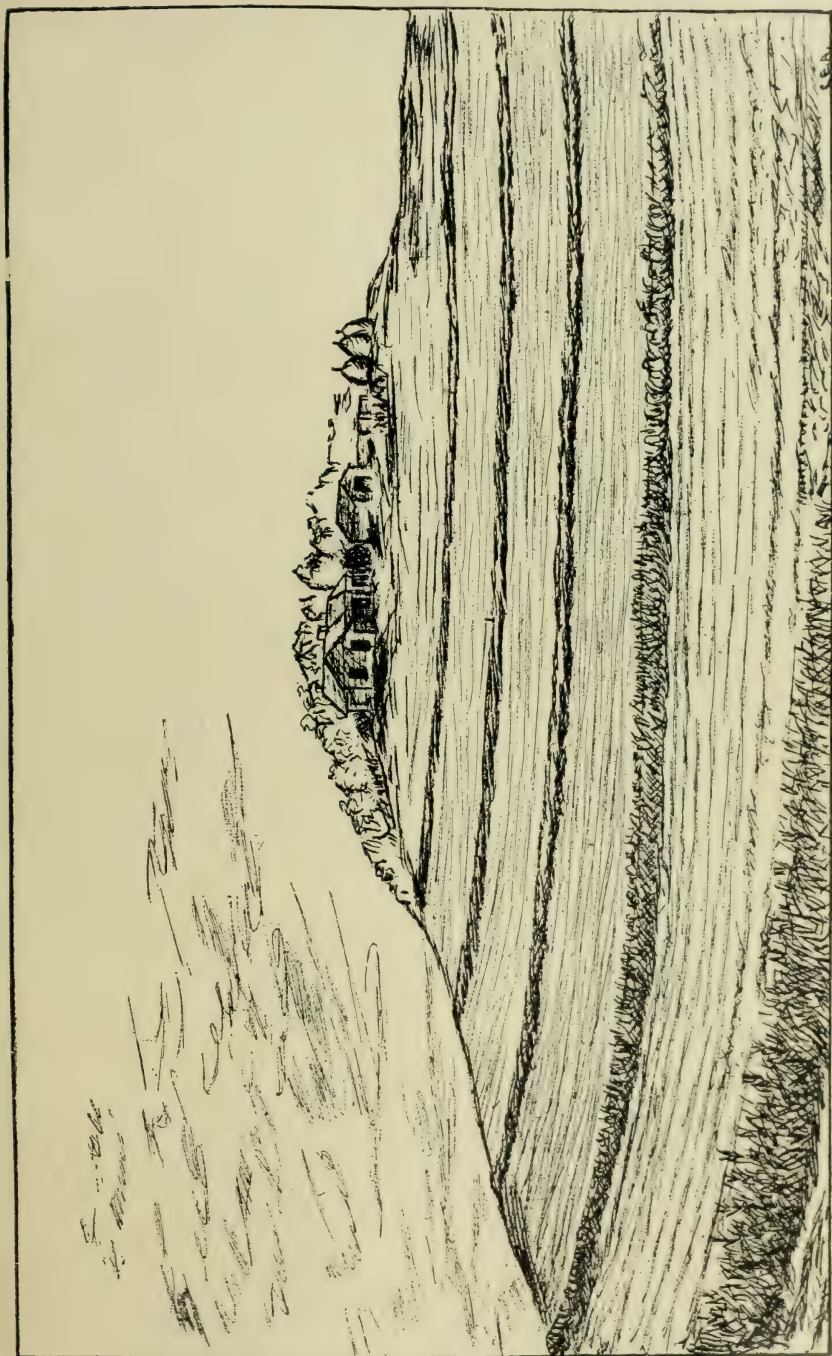


FIG. 2.—SHOWING LEVEL EMBANKMENTS.

A second system of terracing proceeds on the basis of letting the surplus water run, but, by means of rows and embankments make it run slowly. To accomplish this each embankment and each row is given a little fall—the embankments being required to do the bulk of the work. To make this system operate satisfactorily there should be two systems of embankments, the rows running parallel to the main embankments and crossing the shorter ones. (See Fig. 3.)

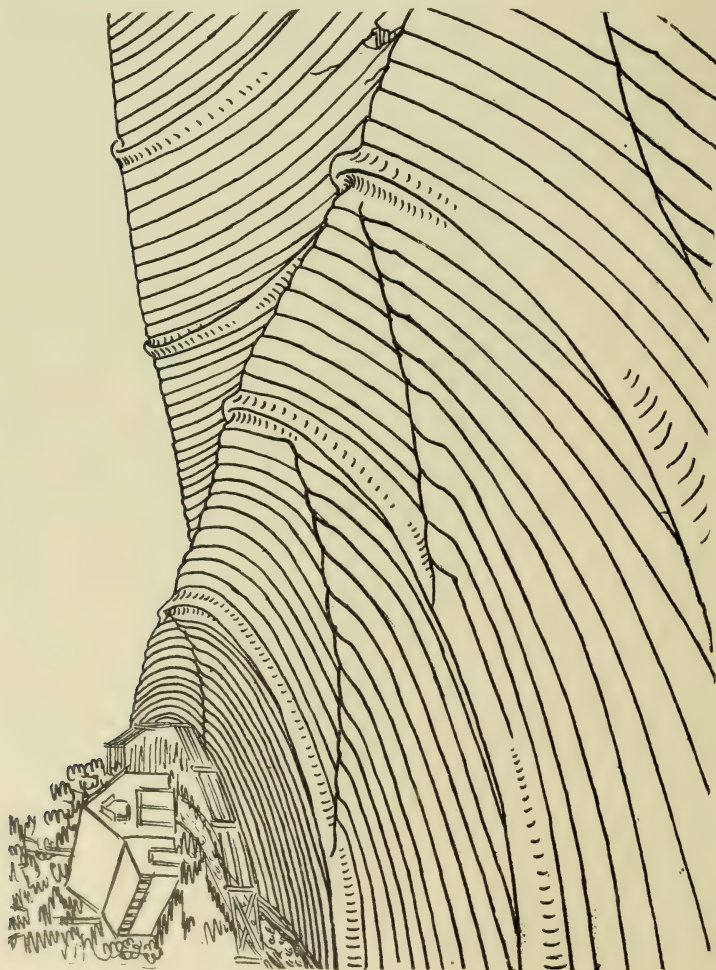


FIG. 3.—SHOWING DOUBLE SYSTEM OF EMBANKMENTS. ALL ROWS AND EMBANKMENTS HAVE SMALL FALL.

At other places on the farm the plan can be made to operate with one system of embankments with the rows crossing these in order that they may conduct the water slowly to them. (See Fig. 4.)

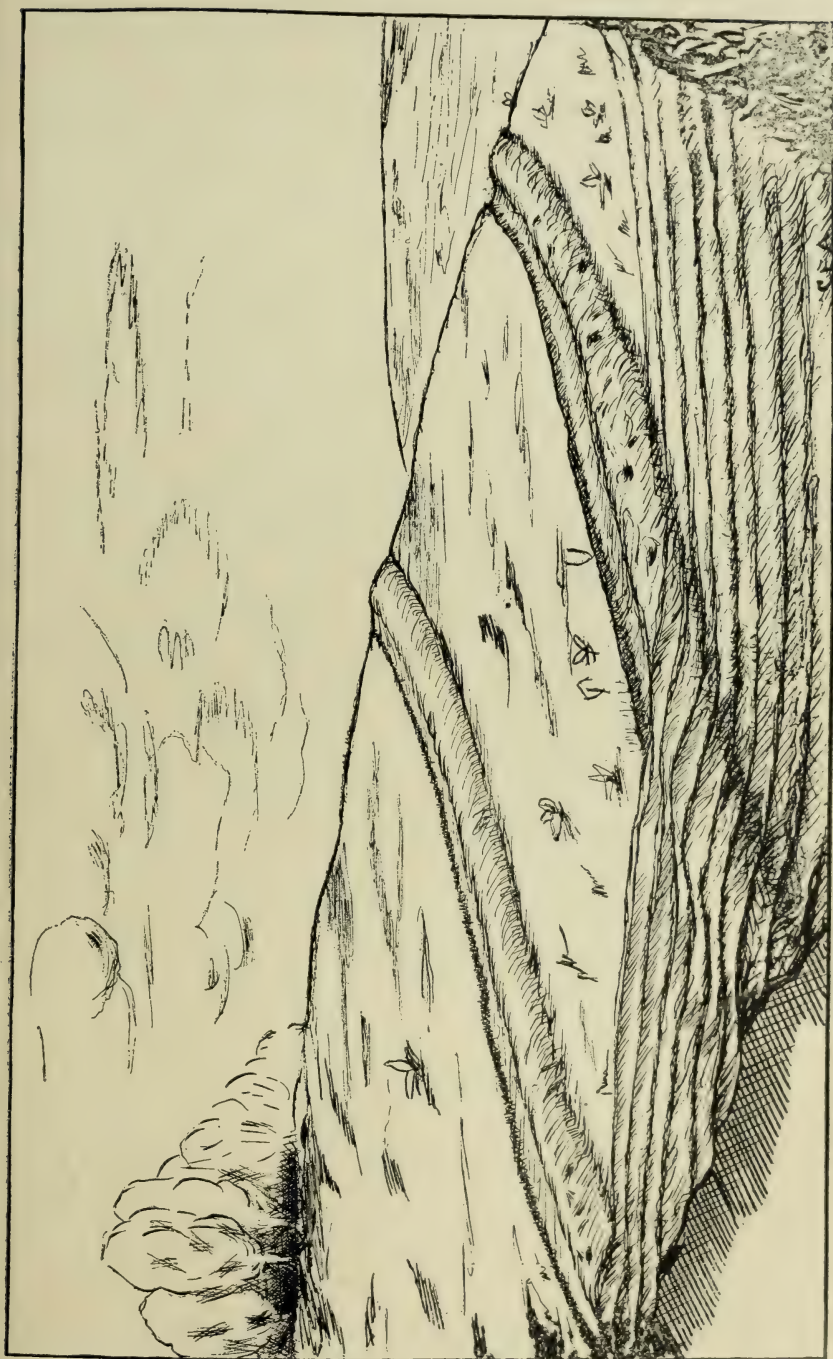


FIG. 4.—SHOWING GRADED EMBANKMENTS WITH ROWS CROSSING.

A third system aims at producing, by the method of plowing real terraces or comparatively level areas on the side or slope of the hillside. To accomplish this, lines of level are run the same as in system one, but no embankments are made. A hillside plow that turns all furrows down hill is always used in breaking. Wherever the lines of level have been run, leave an unplowed space 12 to 15 inches wide at each plowing. Let the soil of the first furrow, in each terrace space, be turned on to the unplowed space, thus elevating this space. If the plow breaks six inches deep, the grade or fall of each terrace space or area will be reduced one foot every time the land is broke. In carrying out this system the rows are run on a level. It only differs from the system first described in not making an embankment to start with and in the use of hillside plow in breaking. (See Fig. 5.)

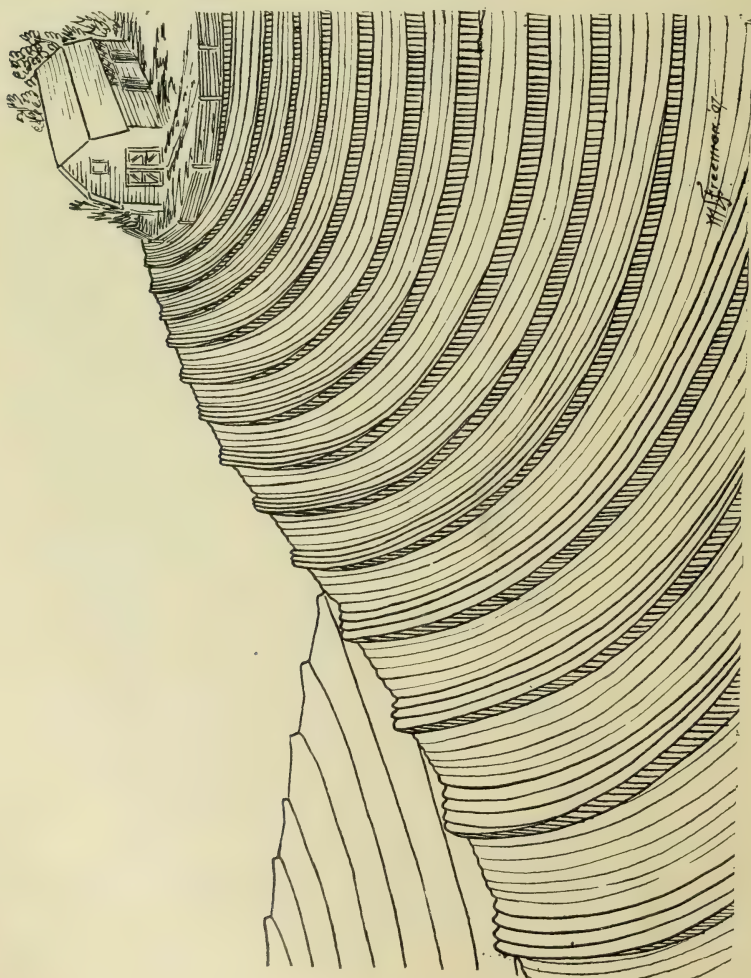


FIG. 5.—SHOWING LEVEL TERRACES MADE WITH HILLSIDE PLOW.

The perpendicular fall between these terraces should be about 4 feet and the same is true of the system of level embankments first described. Where both the embankments and rows are given a fall, as described in the second system, the perpendicular fall between embankments may be 8 feet.

The second system, with embankments and rows having a small fall to conduct surplus water slowly, is in use on the Station grounds. The embankment is essentially a very much enlarged hillside ditch, the bottom of which being four to six feet wide and the bank from four to six feet wide and about eighteen inches high. This broad shallow ditch and broad embankment can be crossed with rows and implements and so cultivated as to lose very little land and can be kept as free from weeds and grass as other parts of the field.

Points on terraces.—Use a level to obtain a uniform fall. Any place along the line of the proposed terrace may be used as a starting point. Seven inches fall to every 100 feet in length is enough, but less fall may be given where the hillside is smooth and not very steep. Any cheap farm level can be used—the one used at the Station has a telescope and cost \$10.00.

The starting point having been selected, place the level at some convenient place that will keep the rodman the longest time within the range of the telescope. Level the instrument and keep it level. Put rodman at starting point and put down a stake. Then have rodman raise or lower target until on a line with cross wires of telescope. Assuming, for description, that the mouth of the terrace is selected as the starting point, let the rodman step 20 steps or about sixty feet in the direction the terrace is to run and lower the target four inches on the rod. Now let him move the rod up or down hill until the target is again on line with the cross wires in the telescope. When this point is found, stick up a stake. Again lower the target four inches on the rod and step, in direction of terrace, about 60 feet and locate second point as was done with one previous, put down a stake and so continue to the end. When necessary to move the level, proceed as given for the first point using the last stake set before moving as a new starting point for the second position of the level. When the stakes are all placed, they are only to be used as guides. The real line of the terrace is now made with a plow with the instrument man as pilot ahead of the team. Getting an embankment or ditch properly located and with the right kind of curves is always a matter that must depend more or less on the judgment of the pilot or man who walks in front of the team. Small irregularities of the surface affect

the location of the stakes, but as such irregularities are obliterated in the construction of the embankment, the pilot or guide must ignore such as he indicates the exact line on which the embankment is to be made.

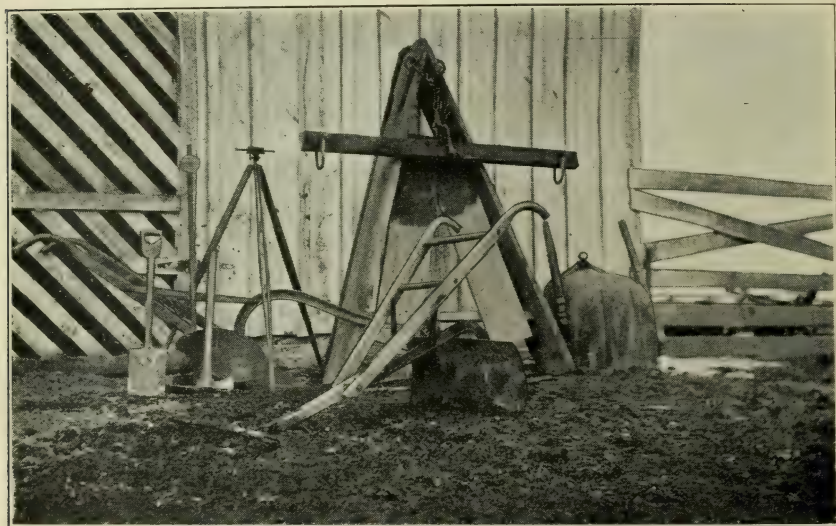


FIG. 6.—SHOWING USEFUL IMPLEMENTS IN FILLING WASHES AND IN MAKING TERRACES.

Making a terrace.—When the line of the embankment or ditch has been determined, plow four to six furrows, preferably turning the soil down hill each time. Then, with the triangular drag shown in Fig. 6 move this plowed soil down hill for the embankment. Plow a second time and move plowed soil down hill as before. After this the embankment may be completed with the surface grader also shown, in Fig. 6. In using this implement the soil is carried straight down hill and the team backed for re'loading. The high places in the bottom of the ditch are removed with a drag scraper and the soil dumped on the low places of the bank. When finished, the bottom of the ditch and the top of the bank should both show a uniform grade.

Cost of terraces.—To ascertain the cost of making terraces, as described above, data for 6,646 feet were obtained. It required the time of two men and one horse for seventeen days. The labor cost \$28.32—7c per rod, or one hour's work for one man.

Reclaiming washed areas.—Uncontrolled water is mainly responsible for gullies but a gully once started, the freezes and thaws of winter aid in making it larger. These same agencies can be made

to assist materially in smoothing the surface. It is entirely feasible to fill the small gullies and washes and to "deaden" the larger ones. A "dead" gully does not increase in size, does not get wider or longer. To "deaden" a gully, slope the sides by digging off and plowing the upper edges and start something growing such as lespedeza, bermuda, and black locust. Filling the smaller gullies is a quick and simple operation and is essentially a team job. First, prepare for the team by digging off the upper edges with a mattock, then use good plows (to include a good ditch bank plow) and good teams.

The cost of filling gullies is not much—less than \$1.00 per acre for the largest and most desirable areas. All the gullies, large and small, were filled on a badly washed hillside for \$5.62 per acre. Fig. 7 shows this hillside planted in peach trees and cowpeas.



FIG. 7.—SHOWING BADLY WASHED HILLSIDE RECLAIMED AND IN ORCHARD TREES.

PLAT WORK WITH FERTILIZERS.

Fertilizers under cotton.—Twenty-eight plats were used on light sod land prepared late in winter. Each plat was 1-20 acre. Variety of cotton, King's Improved. Planted May 18, 1906. Table I gives data obtained.

TABLE I.
RESULTS WITH FERTILIZERS UNDER COTTON AT HOLLY SPRINGS STATION—SEASON 1906.

Plat Nos.	Kind and Quantity of Fertilizers Used on Acre Basis	Quantity first Picking Oct. 10	Quantity second Picking Oct. 30	Quantity third Picking Dec. 31	Total	Pounds of Seed Cotton per acre	Kind and Quantity of Fertilizer Used on Acre Basis	Quantity first Picking Oct. 10	Quantity second Picking Oct. 30	Quantity third Picking Dec. 31	Total	Pounds of Seed Cotton per acre
1	No Fertilizer.....	12	8	6	26	520	11 No Fertilizer.....	9	8	4	21	420
2	200 lbs. Cottonseed Meal.....	18	11	5	34	680	12 400 lbs. Cottonseed Meal.....	21	13	5	39	780
3	200 lbs. Phosphate.....	38	15	6	59	1180	13 400 lbs. Phosphate.....	32	9	1½	42½	850
4	200 lbs. Kainit.....	10	10	6	26	520	14 400 lbs. Kainit.....	9	10	4	23	420
5	No Fertilizer.....	14	10	4	28	560	15 No Fertilizer.....	11	12	4	27	540
6	100 lbs. C. S. Meal; 100 lbs. Phos.	31	12	6	49	980	16 200 lbs. C. S. Meal; 200 lbs. Phos.	36	16	4	56	1120
7	100 lbs. C. S. Meal; 100 lbs. Kainit	15	13	4	32	640	17 200 lbs. C. S. Meal; 200 lbs. Kainit	15	15	8	38	760
8	100 lbs. Phosphate, 100 lbs. Kainit.....	25	15	8	48	960	18 200 lbs. Phosphate, 200 lbs. Kainit.....	30	20	9	59	1180
9	120 lbs. Phosphate, 40 lbs. Cottonseed Meal, 40 lbs. Kainit.....	29	17	6	52	1040	19 240 lbs. Phosphate, 80 lbs. Cottonseed Meal, 80 lbs. Kainit.....	41	16	7	64	1218
10	No Fertilizer.....	12	10	8	30	600	20 No Fertilizer.....	11	11	4	26	520
22	150 lbs. C. S. Meal; 50 lbs. Phos.	24	15	8	47	940	26 300 lbs. C. S. Meal; 100 lbs. Phos.	32	16	4	52	1040
23	100 lbs. C. S. Meal; 100 lbs. Phos.	27	15	5	47	940	27 200 lbs. C. S. Meal; 200 lbs. Phos.	29	17	6	52	1040
24	50 lbs. C. S. Meal; 150 lbs. Phos.	23	13	4	40	800	28 100 lbs. C. S. Meal; 300 lbs. Phos.	16	20	2	38	760
25	No Fertilizer.....	16	13	4	33	660	29 133½ lbs. Cottonseed Meal, 133½ lbs. Phosphate, 133½ lbs. Kainit.....	20	13	2	35	700

Remarks.—The growing season was favorable. Phosphates hastened the maturity of the cotton. On land with some decaying organic matter in it, phosphates alone gave good results, good enough to make it profitable.

Potash alone, or in combination with nitrogen and phosphates, gave no apparent results.

Nitrogen (cottonseed meal) alone gave good results.

Cottonseed meal and phosphates mixed gave good results.

As a tentative proposition, until more data can be obtained, the farmers of the Brownloam area may use cottonseed meal and phosphate mixed half and half on their thinner soils and one third meal and two thirds phosphate on their better soils. Two hundred pounds of this mixture to the acre, applied in the drill will be good.

Fig. 8 shows relative effects of phosphate and potash under cotton.



POTASH.

PHOSPHATE.

FIG. 8.—SHOWING RELATIVE EFFECTS OF POTASH AND PHOSPHATES UNDER COTTON.

Fertilizers under corn.—Mosby corn was planted May 19, 1906. Each plat was 1-20 acre. The rows were four feet wide and six to a plat. Table II gives data with corn.

TABLE II.
RESULTS WITH FERTILIZERS UNDER CORN AT HOLLY SPRINGS STATION, SEASON OF 1906.

Plat Nos.	Quantity and Kind of Fertilizer Used on Acre Basis.	Bushels of Corn Per Acre.	Plat Nos	Quantity and Kind of Fertilizer Used on Acre Basis.	Bushels of Corn Per Acre.
1	No Fertilizer.....	16.66	16	200 Cottonseed Meal; 200 lbs. Phosphate	23.8
2	200 lbs. Cottonseed Meal.....	28.6	17	200 lbs. Cottonseed Meal; 200 lbs. Kainit.....	15.5
3	200 lbs. Acid Phosphate	34.4	18	200 lbs. Phosphate; 200 lbs. Kainit	5.8
4	200 lbs. Kainit.....	18.05	19	240 lbs. Phos.; 80lbs. C-S. Meal; 80 lbs. Kainit ..	7.2
5	No Fertilizer.....	13.6	20	No Fertilizer.....	5.2
6	100 C-S. Meal; 100 lbs. Acid Phosphate	25	22	150 lbs. Cottonseed Meal; 50 lbs. Phosphate	15.5
7	100 lbs. Cottonseed Meal; 100 lbs. Kainit	25	23	100 lbs. Cottonseed Meal; 100 lbs. Phosphate	23.3
8	100 lbs. Phosphate; 100 lbs. Kainit	23.3	24	50 lbs. Cottonseed Meal; 150 lbs. Phosphate	26.3
9	120 lbs. Phos.; 40 lbs. C-S. Meal; 40 lbs. Kainit ..	35.5	25	No Fertilizer	23.6
10	No Fertilizer.....	28	26	300 lbs. Cottonseed Meal; 100 lbs. Phosphate	35.2
12	400 lbs. Cottonseed Meal.....	33	27	200 lbs. Cottonseed Meal; 200 lbs. Phosphate	38.3
13	400 lbs. Phosphate	26.6	28	100 lbs. Cottonseed Meal; 300 lbs. Phosphate	40.8
14	400 lbs. Kainit.....	30.5	29	133 $\frac{1}{3}$ lbs. Cottonseed Meal, 133 $\frac{1}{3}$ lbs. Phosphate, 133 $\frac{1}{3}$ lbs. Kainit.....	43.3
15	No Fertilizer.....	26.3			

Remarks.—The land was thin upland. A drought of seven weeks obtained when the corn was young.

Where the soil contained organic matter phosphates alone gave good results.

Potash alone, or in combination, failed to show any appreciable benefit.

Nitrogen (cottonseed meal) alone gave good results.

A mixture of cottonseed meal and phosphate gave good results.

Until further data is gotten, farmers in the Brownloam area may use, under corn, 200 pounds to the acre of a mixture of cottonseed meal and phosphate, equal quantities by weight.

Fig. 9 shows relative effects of phosphate and potash under corn.



POTASH.

PHOSPHATES.

FIG. 9.—SHOWING RELATIVE EFFECTS OF POTASH AND PHOSPHATES UNDER CORN.

The fertilizer test with peas was interfered with somewhat by the October storm, but it was apparent that both acid phosphate and crude finely ground rock both increased the growth of peas in a marked manner—apparently doubling the crop. (See Fig. 10.)



FIG. 10.—SHOWING COWPEAS FERTILIZED WITH PHOSPHATES.

Mississippi Agricultural Experiment Station.

BULLETIN NO. 109.

FARMER'S INSTITUTE BULLETIN.

GEO. L. CLOTHIER.

AGRICULTURAL COLLEGE, MISS.

APRIL, 1908.

TUCKER PRINTING HOUSE, JACKSON, MISS.

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The Adornment of Rural School Surroundings.

The absence of adornment of rural school surroundings is so common that even a small effort for the improvement of country school grounds or for the preservation of the natural beauty of country school environment calls forth surprise from the passer-by. In no other state are country school-houses and grounds in a more deplorable condition than in Mississippi and in few states is this condition less excusable. Nature has done much for us by providing beautiful trees, shrubs and plants, which may be grown with very little effort on our part, but before we can have any beauty in our surroundings, we must learn to value and appreciate what has been given us by nature without cost.

Before any board of education or committee be permitted to spend money for the adornment of rural school surroundings, protection from live stock and trespassers should be absolutely assured. The first investment on any rural school grounds should be a strong iron fence that will turn all kinds of stock. The next investment should be plenty of hitching posts to accommodate the public who ride or drive to church or social entertainments held at the school-house. Without these precautionary measures decorative planting on the school grounds will be wasted effort.

The elements of environment of a country school that are capable of improvement are the public roads leading to the school-house, the grounds surrounding the building, the shade trees and growing plants, the walks or foot-paths and the out-buildings. Few country people ever think of beautifying a public road, and yet no outward manifestation so quickly betrays the enlightenment and culture of the people of the community as broad roads and streets lined with stately trees. The board of education should exert every possible effort to make the last half mile of every road leading to the school-house as attractive as possible.

Tree planting along public roads should be simple. A single species should be used along the sides of one road and the road should be wide enough to give space for the crowns of the trees to form an arch over-head. Street trees should not be closer together than 60 feet apart in any direction. The best species for streets and public roads are water oak, white elm, sweet gum, bur oak, cow oak, pin oak, pecan and live oak (in the Southern half of Mississippi). Certain species, like Magnolia, are useful in some places for ornament, but are unsuitable for planting at the roadside because of their lack of adaptability to varying conditions of soil. There is no better general purpose

shade tree for Mississippi than water oak. The young trees 10 to 12 feet tall may be readily obtained from the bottomlands at small expense in almost every part of the state.

Don't waste money on maples or Carolina poplars. The maples are better adapted to cool northern climates, while the poplars, or cottonwoods, are inferior shade trees anywhere. Don't be led into planting a fancy horticultural variety because it is highly recommended by some nursery advertisement.

How to handle nursery stock.—It is strange that few people comprehend the function of the roots of trees. During the fall or spring season, it is not an unusual sight to meet wagon loads of trees on their way from the town to the country without a vestige of protection to their roots. A transient tree pedlar has been making delivery to his deluded customers, and, although his slick tongue may have sold seedlings for fine budded varieties, he has failed to use his tongue to instruct his customers in the most elementary rudiments of the tree business. It would be just about as foolish for a farmer to haul a load of fish fifteen miles across the country in an open wagon bed for the purpose of dumping them into a fish pond to stock the pond, as for him to haul out trees with their naked roots exposed to plant on his farm. Many plants cannot live with their roots out of moisture any longer than a fish can live out of water. Trees should be shipped with their roots packed in damp sphagnum moss, and each package should either be boxed or coated with sage grass and wrapped in burlap. The tree peddler who delivers nursery stock without packing on its roots should be prosecuted for getting money under false pretenses.

As soon as the planter receives his trees, he should take them to the planting site and heel them in until he is ready to plant them. This is done by digging a trench with a sloping bank and leaning the trees over towards the slope and covering their roots with the soil taken out of another trench dug parallel to the first. A second layer of trees is put into the second trench and covered in the same manner, and the process repeated until all have been heeled in. The soil should be sifted in among the fine roots so as to fill up any air spaces that might occur among the roots.

At planting time the trees should be taken out of their place of storage as needed and each tree should have its roots wrapped in wet burlap while it is being carried to the hole in which it is to be planted.

The planting operation is simple. The hole to receive the tree should be deep and wide enough to allow space for the roots to spread out in their natural position. The fine, rich soil should be put next to the fibrous roots, and if the natural soil is very poor, a few quarts of

bone meal sifted into the soil around the roots of each tree will be a good fertilizer. Stable manure should never be used in contact with the roots of trees.

A shade tree twelve feet tall and one inch in diameter at breast height should be pruned to a single central shoot. Cutting back the main stem of a tree more than ten feet tall is usually to be condemned. The majority of people imagine that pruning exerts some mysterious influence upon a tree. Pruning a transplanted tree is necessary to reduce its top in proportion to the unavoidable curtailment of the root system in digging, but pruning is a surgical operation that should be used as sparingly as possible. When young and small trees are transplanted, the larger part of the root system may be taken up with the plants, and little pruning of the tops will be necessary. Some of the best nurserymen take up their trees with balls of earth around the roots held in place by burlap. This is the very best possible protection that can be given to the roots of plants in transit, but the planter should cut loose the strings and remove the wrappings when he plants the trees.



FIG. 1—BALLED PLANTS READY FOR SHIPMENT.

[Courtesy of D. Hill, Nurseryman, Dundee, Ill.]

Shrubs, lawns, and walks.—The planting of shrubs on school grounds should not be attempted until a comprehensive plan has been prepared and adopted by the school board. Every planting plan should contain maps and specifications for guidance of the future planters. The arrangement of the shrubs should be in a natural manner. There should be clumps of shrubbery to hide unsightly objects and open lawn spaces between. The borders of the lawn should be edged with beautiful flowers and shrubs as the frame surrounds the picture. Green grass should make the ground work of the picture. If Mississippi school-houses were surrounded by beautiful lawns instead of bare yellow clay banks, the love of grass plants might be better instilled into the hearts of the children, and the future agricultural greatness of the state would be assured, for no state or nation has ever become great by ignoring pastoral pursuits.

Shrubbery should be "banked", that is arranged with low growing plants in front and taller behind. Hedges of evergreens should shut out the public gaze from sequestered nooks, and clumps of tall shrubs and low trees should be massed in front of sheds, stables, or other out-buildings.

Walks should be laid out in the direction that the most travel is likely to go. The rule that straight lines should be banished from decorative planting need not be adhered to strictly, for it is folly to expect people to go far out of their way in order that we may have a curved walk; and yet we must remember that the curve is the line of beauty. The walks should be graveled or paved with cinders and should be 4 or 5 feet wide. It is well to edge them up at first with planks so as to delineate their boundaries beyond question.

Strict rules should be made keeping the children off the grass and flower beds until the plantings are thoroughly established. The best lawn grass for the greater part of this state is bermuda. It is easily established by planting small pieces of the sod every two or three feet. If the soil is too sandy and poor to grow grass, it should be fertilized with stable manure until it will support a sod.

Expensive shrubbery need not be planted; and yet there should be samples of the best that can be grown in the community. If the teacher having charge of the planting will write to most any reliable dealer, special rates may be obtained on shrubbery to be planted around school-houses because of the increase of trade that such plantings will bring. The following types of shrubbery should be represented on every well kept school grounds: roses, spiraeas, privets, lilacs, hydrangea, deutzias, forsythias, altheas, Euonymus (box, wrongly called), magnolias, Rosedale cedars, and Chinese arbor-vitae. The great majority

of the shrubs and trees above enumerated may be propagated readily from cuttings, and their propagation and planting may be done by the teacher and pupils as a part of the instruction in agriculture. The cape jasmine grows throughout the long-leaf pine belt, but is killed back to the ground every eight or ten years. It is too tender to be of much value in the northern half of the state as is also the *Camellia Japonica*. The evergreen *Euonymus* makes a splendid hedge plant, and the type with golden spotted foliage has no superior for decorative uses in the southern states. The California privet is one of the best privets grown for hedges, its erect habit making shearing not necessary. The evergreen Japanese privet, *Ligustrum Japonicum*, is beautiful either as a hedge or as a single plant. The Rosedale cedar from Texas is one of the best coniferous hedge plants adapted to the south. The spiraeas (Bridalwreaths) are surpassed in beauty by few deciduous flowering shrubs. Seventeen varieties of Spiraeas are on trial at the College, of which the leading are the following: *Spiraea Van Houttei*, *S. Thunbergii*, *S. Prunifolia*, *S. Anthony Waterer*, and *S. Callosa Alba*. *Spiraea Van Houttei* may well be said to be queen of the lawn when in full bloom. Fig. 2 gives an illustration of a group of Van Houttei Spiraeas massed in front of the corner of a building.



FIG. 2—SPIRAEA VAN HOUTTEI.

[Courtesy of D. Hill, Nurseryman, Dundee, Ill.]

The Forsythias or golden bells, blossom late in winter, covering their greenish branches with a profusion of yellow blooms before the leaves come out. The only hydrangea that has proven itself perfectly hardy at the College is *Hydrangea Paniculata Grandiflora*. It blooms in July and August and seems to delight in heat and drouth, taking the place of the more tender snow-balls that come earlier. Fig. 3 is an example of *Hydrangea Paniculata Grandiflora* as it puts on its heads of creamy white blossoms in July that seem to last for months. It should be planted in every lawn where it will thrive and is so far superior to all the fancy high priced hydrangeas quoted by the trade, that it seems strange that it is not more common.



FIG. 3.—HYDRANGEA PANICULATA GRANDIFLORA.

[Courtesy of D. Hill, Nurseryman, Dundee, Ill.]

The Altheas are also late summer bloomers. Several varieties have proven themselves hardy at the College. Deutzias are beautiful early summer bloomers that have been used very extensively in the decoration of the grounds of the National Capitol at Washington. Magnolias, lilacs, and roses are so well known that no description of them is needed here.

Various types of the Chinese arbor-vitae have proven themselves hardy in the southern states, the one with golden foliage being a favorite. The novice who purchases arbor-vitae is likely to be defrauded by receiving plants of the American *Thuja* instead of the Chinese *Biota*. The American species are adapted to grow only in cool, moist climates and are absolutely worthless south of the Ohio River, except in the high Southern Appalachians. Money spent for American arbor-vitae to be planted in Mississippi will be wasted.

The rhododendrons and laurels are fine plants for western North Carolina, but have little to recommend them for Mississippi. They abhor a limey soil and for that reason can scarcely be made to survive to the second year at the College.

Vines.—The planting of vines will often be serviceable on school grounds. Where a summer term of school is held, an arbor of vines with seats beneath will afford much comfort and pleasure to the older pupils during intermissions. The vines that may be used for decorative planting in Mississippi are various species of *Ampelopsis*, *Clematis* and grape. The English Ivy is hardy and easily grown from cuttings. The *Wistaria* vines, honeysuckles and trumpet creeper may be used to cover unsightly objects as old tree snags, stumps, etc. The trumpet creeper is native throughout Mississippi and may be collected from along the fences. The five-leaved ivy, *Ampelopsis Quinquefolia* is also found wild in most parts of the state. The climbing *Eleagnus* and the climbing *Euonymus* are both beautiful evergreens that may be purchased from nurseries.

Flowers.—To complete the lawn feature of the school grounds flower beds should be planted at the right places. As with the shrubbery, the flowers should not be scattered over the lawn like the plants in a cotton patch. They should be put in borders between the grassy areas and the shrubs, or as edgings along the walks. The two general classes of flowers that may be used are foliage plants and flowering plants. It may not be feasible to attempt the growth of foliage plants at a country school, but the coleus, alternanthera and variegated geraniums are so easily propagated that the enthusiastic teacher may find a rich reward in handling these plants. A goodly number of hardy bulbs should be buried deep in the edge of the bermuda sod to spring up while the grass is yet asleep and gratify the eyes of the children. A native bulbous plant in Texas called the "Rain Lily" suddenly springs into bloom when rain follows a drouth, and one arises in the morning to find the barren sod of the day before strewn with beautiful flowers that look like stars fallen from heaven. The sudden appear-

ance of crocuses, hyacinths, daffodils, jonquils, and tulips at the first warm breath of spring, fills the season with promise and gladdens the heart of childhood. Hardy varieties of all these bulbs should be found on every school lawn. The Irises, or old fashioned "flags", make splendid borders for walks. Cannas make good centers to large sized flower beds, and the elephant's ear (*Caladium esculentum*) looks well grouped around the cannas.

Of the non-bulbous flowers the carnation pink is as easily grown as anything, unless it is sweet peas. Pansies and violets may enter into the low border along the walks together with fragrant mignonette and heliotrope. Dwarf phlox will carpet a bare bank, while *Jasminum Officinale* may clamber around the foundations of the buildings to hide ugly places. Chinese Asters, hardy chrysanthemums, tiger lilies, peonies, salvias, nasturtiums, balsams, zinnias, verbenas and cosmos may all be planted in the background where their size will not hide the more modest flowers of small stature, like pansies and violets. It will be necessary for the teacher to experiment with each kind of flower proposed to be used. These experiments should be made in the school-garden to determine the comparative size and rate of growth of different plants that are to be assembled in juxtaposition on the school campus. The school children should be encouraged to enter into these preliminary tests in co-operation with the teacher.

It is seen from the above recommendations that this bulletin contemplates a plan for the school grounds that will take several years to work out. The writer believes it is the only way to keep up a sustained interest.

Figure 4 is an outline plan of a model country school after the execution of the main features of the planting plan.

MISSISSIPPI EXPERIMENT STATION.

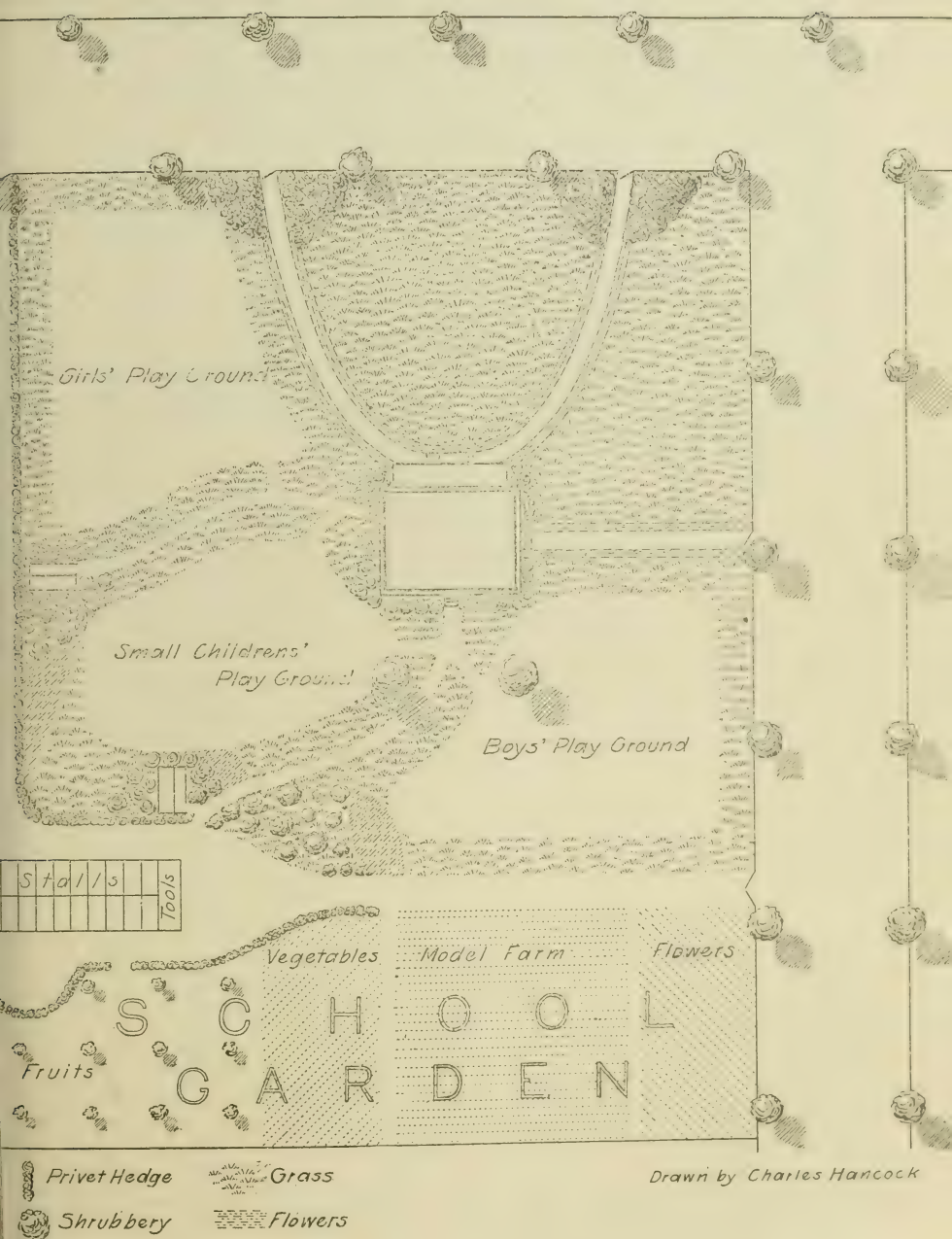


FIG. 4—PLAN OF A MODEL COUNTRY SCHOOL.

The time to begin planting is in the fall in Mississippi, because the weather is usually sufficiently dry at that season to get the ground prepared properly. If winter should come on with the planting unfinished, the completion of the work in the spring will be easy. One should have all his plans made and order his nursery stock before November 1. Planting of trees and shrubs may be done successfully from December to March, but the early planting is likely to prove most satisfactory. If teachers and pupils will get together and work with a will there is no good reason why the country school houses of our state should not become places of beauty.

The author desires to express his appreciation of the help received from Professor Charles Hancock, of the Department of Civil Engineering, who drew the plan of a model country school, Fig. 4; and also to acknowledge his obligations to Mr. D. Hill, Nurseryman, Dundee, Illinois, for the loan of cuts for Figs. 1, 2, and 3.

Mississippi Agricultural Experiment Station.

BULLETIN NO. 110.

JANUARY, 1908.

REPORT OF THE WORK AT THE HOLLY SPRINGS STATION FOR 1907.

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BY C. T. AMES.

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### INTRODUCTION.

This Bulletin contains fertilizer results under cotton, corn, and cowpeas; also the information so far obtained with grasses and forage crops.

### FERTILIZER TEST WITH CORN.

Thirty plats and thirty duplicate plats of one twentieth of an acre each (Six rows four feet wide and ninety-two feet long) were fertilized as shown in the following table, and planted to Mosby's Prolific Seed Corn, April twenty-seventh.

Weather conditions necessitated a second planting, May twentieth.

**Soil.**—The soil used was a brownish loam rolling upland which varied somewhat in fertility.

An attempt was made by the use of stable manure to equalize the soil's productiveness as far as possible.

The soil on which the thirty plats were planted, also the first fifteen plats in duplicate plats, grew a good crop of cowpeas the year before.

The remaining fifteen plats were on soil which was planted in corn the year before.

Following is a table giving results, and a calculated yield per acre:



**RESULTS WITH FERTILIZERS UNDER CORN.**  
**Amount of Fertilizers Calculated in Pounds Per Acre.**

| 200 LBS. PER ACRE.                |                              | 400 LBS. PER ACRE.                                |                                   | Duplicate Plats--<br>Yield in Bushels<br>per Acre |                                                   |
|-----------------------------------|------------------------------|---------------------------------------------------|-----------------------------------|---------------------------------------------------|---------------------------------------------------|
| Number of Plat                    | Yield in Bushels<br>per Acre | Duplicate Plats--<br>Yield in Bushels<br>per Acre | Number of Plat                    | Yield in Bushels<br>per Acre                      | Duplicate Plats--<br>Yield in Bushels<br>per Acre |
| 1 No Fertilizer                   | 34.16                        | 20.55                                             | 11 No Fertilizer                  | 28.05                                             | 29.44                                             |
| 2 200 lbs. Cottonseed Meal        | 38.05                        | 22.5                                              | 12 400 lbs. Cottonseed Meal       | 33.61                                             | 28.05                                             |
| 3 200 lbs. Acid Phosphate         | 32.50                        | 31.38                                             | 13 400 lbs. Acid Phosphate        | 37.50                                             | 29.72                                             |
| 4 200 lbs. Kainit.                | 30.00                        | 26.38                                             | 14 400 lbs. Kainit.               | 28.33                                             | 18.05                                             |
| 5 No Fertilizer                   | 29.72                        | 31.66                                             | 15 No Fertilizer                  | 25.83                                             | 16.94                                             |
| 6 100 lbs. Acid Phosphate         |                              |                                                   | 16 200 lbs. Acid Phosphate        |                                                   |                                                   |
| 7 100 lbs. Cottonseed Meal        | 35.27                        | 26.38                                             | 17 200 lbs. Cottonseed Meal       | 18.05                                             | 13.88                                             |
| 8 100 lbs. Kainit.                | 30.55                        | 20.00                                             | 18 200 lbs. Kainit.               | 21.66                                             | 5.55                                              |
| 9 120 lbs. Acid Phosphate         | 29.16                        | 26.66                                             | 19 240 lbs. Acid Phosphate        | 23.05                                             | 2.22                                              |
| 40 lbs. Cottonseed Meal           | 23.61                        | 29.72                                             | 80 lbs. Cottonseed Meal           | 21.38                                             | 3.61                                              |
| 40 lbs. Kainit.                   | 21.66                        | 3.61                                              | 80 lbs. Kainit.                   | 17.22                                             | 12.22                                             |
| 10 No Fertilizer                  | 21.66                        | 3.61                                              | 20 No Fertilizer                  | 12.50                                             | 21.11                                             |
| 22 150 lbs. Cottonseed Meal       | 23.61                        | 11.11                                             | 26 300 lbs. Cottonseed Meal       | 26.38                                             | 21.38                                             |
| 50 lbs. Acid Phosphate            |                              |                                                   | 100 lbs. Acid Phosphate           | 29.44                                             | 21.66                                             |
| 23 100 lbs. Cottonseed Meal       | 21.66                        | 12.77                                             | 27 200 lbs. Acid Phosphate        | 29.16                                             | 26.94                                             |
| 100 lbs. Acid Phosphate           | 23.61                        | 12.50                                             | 28 100 lbs. Cottonseed Meal       | 27.22                                             |                                                   |
| 24 50 lbs. Cottonseed Meal        |                              |                                                   | 300 lbs. Acid Phosphate           |                                                   |                                                   |
| 150 lbs. Acid Phosphate           |                              |                                                   | 133 1-3 lbs. Cottonseed Meal      |                                                   |                                                   |
| 25 No Fertilizer                  | 26.94                        | 12.22                                             | 133 1-3 lbs. Acid Phosphate       |                                                   |                                                   |
| 30 400 lbs. Ground Phosphate Rock | 32.08                        |                                                   | 133 1-3 lbs. Kainit.              |                                                   |                                                   |
|                                   |                              |                                                   | 31 800 lbs. Ground Phosphate Rock |                                                   |                                                   |

**Remarks.**—During continued heavy rains following shortly after fertilizing and planting the plats, a portion of the fertilizer may have been lost by soil washing. All plats on soil after cowpeas, which were fertilized with acid phosphate, or cottonseed meal, or a mixture of the two, were very promising until checked by drought. At no stage of growth in plats Nos. 10, 15 to 20, and 22 to 25, in duplicate plats, was there any prospect for fruit. These plats mentioned were on soil after corn the year before. Two months protracted drought, before and during the fruiting season; also, variation in soil, affected results very materially.

**Conclusions.**—Both available phosphorous and nitrogen are deficient.

With the assistance of field notes it would appear, that a mixture 100 pounds Acid Phosphate and 100 pounds cottonseed meal, per acre, will give good results.

On more fertile soils, Acid Phosphate alone 200 pounds to 400 pounds per acre, as the soils' fertility increases, will give good results.

More profitable results from the use of fertilizers can be obtained on land grown in cowpeas the year before.

It is not profitable to grow corn on thin uplands.

#### FERTILIZER TEST WITH COTTON.

Thirty plats of one twentieth of an acre each, containing six rows, four feet wide and ninety-two feet long, were fertilized as shown in the following table, and planted to Cook's Improved Cotton Seed, April 27th.

Weather conditions necessitated a second planting May 20th.

**Soil.**—Brownish loam, slightly rolling table land.

The following table gives the quantity and kind of fertilizers used; also dates of each picking, and a calculated yield per acre. It also contains an estimate value of crop per acre, on basis of three cents per pound for seed cotton:

# FERTILIZER TEST WITH COTTON.

Amount of Fertilizer calculated in pounds per acre.

| 200 pounds per acre. |                                |               |                |                  |                |       |                |                                     |                 | 400 pounds per acre. |                                |                |                  |                |       |                |                                     |      |         |
|----------------------|--------------------------------|---------------|----------------|------------------|----------------|-------|----------------|-------------------------------------|-----------------|----------------------|--------------------------------|----------------|------------------|----------------|-------|----------------|-------------------------------------|------|---------|
| Number of Plats      | Picked Sept. 21                | Picked Oct. 3 | Picked Oct. 17 | Picked Nov. 9-16 | Picked Jan. 21 | Total | Yield per Acre | Value at 3¢ per lb. for Seed Cotton | Number of Plats | Picked Sept. 21      | Picked Oct. 3                  | Picked Oct. 17 | Picked Nov. 9-16 | Picked Jan. 21 | Total | Yield per Acre | Value at 3¢ per lb. for seed Cotton |      |         |
| 1                    | No Fertilizer                  | 4             | 6              | 8                | 19             | 6     | 43             | 860                                 | \$25.80         | 11                   | No Fertilizer                  | 2              | 3                | 5              | 13    | 6              | 29                                  | 580  | \$17.40 |
| 2                    | 200 lbs. Cottonseed Meal       | 9             | 9              | 10               | 22             | 7     | 57             | 1140                                | 34.20           | 12                   | 400 lbs. Cottonseed Meal       | 6              | 7                | 9              | 14    | 3              | 39                                  | 780  | 23.40   |
| 3                    | 300 lbs. Acid Phosphate        | 10            | 11             | 12               | 23             | 4     | 60             | 1200                                | 36.00           | 13                   | 400 lbs. Acid Phosphate        | 9              | 7                | 8              | 19    | 4              | 47                                  | 940  | 28.20   |
| 4                    | 400 lbs. Kainit                | 5             | 6              | 8                | 21             | 7     | 47             | 940                                 | 28.20           | 14                   | 400 lbs. Kainit                | 3              | 6                | 7              | 18    | 5              | 39                                  | 780  | 23.40   |
| 5                    | No Fertilizer                  | 4             | 6              | 8                | 20             | 5     | 43             | 860                                 | 25.80           | 15                   | No Fertilizer                  | 4              | 5                | 9              | 18    | 4              | 40                                  | 800  | 24.00   |
| 6                    | 100 lbs. Cottonseed Meal       |               |                |                  |                |       |                |                                     |                 | 16                   | 200 lbs. Cottonseed Meal       |                |                  |                |       |                |                                     |      |         |
| 7                    | 100 lbs. Acid Phosphate        | 8             | 11             | 9                | 25             | 4     | 57             | 1140                                | 34.20           | 17                   | 200 lbs. Acid Phosphate        | 9              | 10               | 10             | 26    | 3              | 58                                  | 1160 | 34.80   |
| 8                    | 100 lbs. Cottonseed Meal       |               |                |                  |                |       |                |                                     |                 | 18                   | 200 lbs. C-S, Meal             |                |                  |                |       |                |                                     |      |         |
| 9                    | 100 lbs. Kainit                | 5             | 7              | 8                | 19             | 5     | 44             | 880                                 | 26.40           | 19                   | 200 lbs. Kainit                | 5              | 9                | 11             | 25    | 4              | 54                                  | 1080 | 32.40   |
| 10                   | 50 lbs. Acid Phosphate         | 7             | 8              | 9                | 21             | 4     | 49             | 980                                 | 29.40           | 20                   | 200 lbs. Acid Phosphate        | 10             | 11               | 12             | 23    | 4              | 60                                  | 1200 | 36.00   |
| 11                   | 120 lbs. Kainit                |               |                |                  |                |       |                |                                     |                 | 21                   | 240 lbs. Kainit                |                |                  |                |       |                |                                     |      |         |
| 12                   | 40 lbs. Acid Phosphate         | 9             | 9½             | 10               | 21             | 2     | 51½            | 1030                                | 30.90           | 22                   | 40 lbs. Acid Phosphate         | 12             | 10               | 11½            | 26    | 4              | 63½                                 | 1270 | 38.10   |
| 13                   | 40 lbs. Cottonseed Meal        |               |                |                  |                |       |                |                                     |                 | 23                   | 80 lbs. C-S, Meal              |                |                  |                |       |                |                                     |      |         |
| 14                   | 40 lbs. Kainit                 |               |                |                  |                |       |                |                                     |                 | 24                   | 80 lbs. Kainit                 |                |                  |                |       |                |                                     |      |         |
| 15                   | No Fertilizer                  | 7             | 6              | 6                | 16             | 3     | 38             | 760                                 | 22.80           | 25                   | No Fertilizer                  | 5              | 7½               | 6              | 20    | 4              | 42½                                 | 850  | 25.50   |
| 16                   | 150 lbs. Cottonseed Meal       |               |                |                  |                |       |                |                                     |                 | 26                   | 300 lbs. C-S, Meal             |                |                  |                |       |                |                                     |      |         |
| 17                   | 50 lbs. Acid Phosphate         | 9             | 8              | 8                | 18             | 2     | 45             | 900                                 | 27.00           | 27                   | 100 lbs. Acid Phosphate        | 14½            | 10               | 9              | 22    | 3              | 58½                                 | 1170 | 35.10   |
| 18                   | 100 lbs. Cottonseed Meal       |               |                |                  |                |       |                |                                     |                 | 28                   | 200 lbs. C-S, Meal             |                |                  |                |       |                |                                     |      |         |
| 19                   | 100 lbs. Acid Phosphate        | 10            | 8              | 6                | 16             | 1     | 41             | 820                                 | 24.60           | 29                   | 200 lbs. Acid Phosphate        | 15             | 10               | 9              | 24    | 1              | 59                                  | 1180 | 35.40   |
| 20                   | 50 lbs. Cottonseed Meal        | 5             | 7              | 9                | 35             | 0     | 56             | 1120                                | 33.60           | 30                   | 300 lbs. Cottonseed Meal       |                |                  |                |       |                |                                     |      |         |
| 21                   | 150 lbs. Acid Phosphate        |               |                |                  |                |       |                |                                     |                 | 31                   | 133 1-3 lbs. C-S, Meal         | 8              | 7                | 7              | 31    | 0              | 53                                  | 1060 | 31.80   |
| 22                   | No Fertilizer                  | 0             | ½              | 7                | 27             | 0     | 34½            | 690                                 | 20.70           |                      | 133 1-3 lbs. C-S, Meal         | 5              | 10               | 8              | 33    | 0              | 56                                  | 1120 | 33.60   |
| 23                   | 400 lbs. Ground Phosphate Rock | 0             | 1              | 7                | 20             | 0     | 28             | 560                                 | 16.80           |                      | 800 lbs. Ground Phosphate Rock | 2              | 8                | 12             | 24    | 0              | 46                                  | 920  | 27.60   |



**Remarks.**—With plats located in the field, as indicated in the table, and using the results on blank plats as a basis, soil variations can easily be traced.

The soil on which plats thirty and thirty-one were located is below the average. The continued drought during August and September caused some shedding of bolls.

**Conclusions.**—Results plainly indicate that available Phosphorous is deficient, and that an application of Acid Phosphate can be made very profitable, when a sufficient quantity of Nitrogen is present.

It appears that a mixture of fifty pounds of Cottonseed Meal and one hundred and fifty pounds of Acid Phosphate is the safest and best fertilizer for cotton, for this class of soil.

Indications are, that available Potash is present in sufficient quantities in these soils, and that it would be a waste of funds to add more.

#### FERTILIZER TESTS WITH COWPEAS.

Five plats and five duplicate plats of one twentieth of an acre each, were planted, in rows, June 17th. The soil was a thin upland yellowish loam.

The following table gives the quantity and kind of fertilizer used, and yield of vine in pounds per acre:

| No. Plats |                                      | Pounds of<br>Vines<br>Per Acre. | Duplicate<br>Plats,<br>Yield Vines<br>Per Acre. |
|-----------|--------------------------------------|---------------------------------|-------------------------------------------------|
| 1         | No Fertilizer .....                  | 576                             | 1044                                            |
| 2         | 200 lbs. Acid Phosphate.....         | 1656                            | 1440                                            |
| 3         | 400 lbs. Ground Phosphate Rock ..... | 1572                            | 1452                                            |
| 4         | 200 lbs. Kainit.....                 | 852                             | 963                                             |
| 5         | 100 lbs. Acid Phosphate.....         |                                 |                                                 |
|           | 100 lbs. Kainit.....                 | 1464                            | 1380                                            |

**Remarks.**—Soil on plat No. 1 below the average.

**Conclusion.**—Available Phosphorous is deficient.

An application of from one hundred to two hundred pounds of Acid Phosphate will increase the yield very materially.

Available Potash is present in sufficient quantities for all practical purposes.

### GRASSES AND FORAGE CROPS.

On March 29th, 1907, the following grasses and forage crops were planted on brownish loam upland, viz.: Red Clover, Alsike Clover, White Clover, Crimson Clover, Alfalfa, Melilotus, Lespedeza, Spring Vetch, Johnson Grass, Bermuda Grass, Orchard Grass, Kentucky Blue Grass, Rye Grass, Red Top, or Herds' Grass, and Sanfoin.

Forty-eight plats were employed in this test. Fertilizers were used on some plantings, and various seed mixtures were planted.

An excellent stand was secured on all plantings. At the end of the summer season but few plats remained.

**Bermuda Grass** made a perfect sod, but was of slow growth.

**Lespedeza**, or Japan Clover, did well. This plant makes a profitable growth on almost any soil in this section. Its growth should be encouraged on all waste lands as a soil improver, and for pasture, and on better classes of land as a hay crop.

A mixture of Bermuda and Lespedeza makes a most excellent pasture.

**Red Top.**—Better results were obtained in fall planting for pasture than results in plats would indicate. On thin land it was an absolute failure; on low lands and land of ordinary fertility, fair results were obtained.

**Hairy Vetch.**—In fall planting with oats on fertile spots, a magnificent growth was obtained. On thin land it proved a failure. No inoculation of soil was made.

**Red Clover.**—On plat where ten tons of barnyard manure and 1,000

pounds of lime per acre, were used, one cutting fourteen inches high was secured. On plats not so treated, the growth was poor.

**Alfalfa.**—Out of sixteen plats, only two plats which were cultivated survived the season. These two plats were cultivated after each rain and while a perfect stand now remains, but little growth was made.

**Melilotus.**—Slow growth was made during the entire season. Indications are that lime is beneficial.

**Orchard Grass,** Kentucky Blue Grass, and Crimson Clover, with a little encouragement would grow.

White Clover, Alsike Clover, Rye Grass, Spring Vetch (Spring planting) and Sanfoin made a failure.

Johnson Grass made but poor growth.





# Mississippi Agricultural Experiment Station

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BULLETIN NO. 111.

JANUARY, 1908.

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## EXPERIMENTS IN FEEDING DAIRY COWS

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BY J. S. MOORE.

In this Bulletin the results of the following experiments and conclusions in regard to them are reported:

1. The effect of feeding grain to cows getting soiling crops.
2. Feeding soiling crops vs. cottonseed meal.
3. Feeding large, medium, and small grain rations to dairy cows.
4. Value of corn silage as a feed for dairy cows.
5. Protecting cows from hot sun in summer.
6. The influence of shelter for dairy cows.

In order that the dairyman may easily get the results obtained from feeding the above feeds, all details are omitted. These may be found in the annual reports of the Station.

1. Effect of feeding grain to cows getting soiling crops.—In order to determine the practical value of feeding both soiling crops and grain feeds to cows at the same time, we made two experiments, one lasting 16 weeks and the other 10 weeks. In both all of the cows were given all the green feed, consisting of alfalfa, sorghum, and Johnson grass, that they would eat. In addition to the above, one-half of the cows in the first experiment were given two pounds each of cottonseed meal daily and in the second experiment one-half of the cows received three and four-tenths pounds of cottonseed meal each. In the first trial, the cows getting cottonseed meal gave 5% better returns in milk than did those receiving no meal; but this was not sufficient to pay for the feed consumed. Allowing the market prices for the feed at the time that this work was done, we find that the milk from the cows getting no meal cost 29.8 cents per 100 pounds, and that from those

receiving meal cost 40.3 cents per hundred pounds. In the second trial there was no apparent increase due to the meal fed. So far as the results of these two tests are concerned, they would indicate that where the cows are being liberally fed on good soiling crops it will not pay to give them any grain feed.

2. Feeding soiling crops vs. cottonseed meal.—The question is often asked, "Can I afford to feed grain feed in summer when pasture is not available?, or would it be better to grow some crop that can be fed green?" In order to answer this question, the following test was made: All of the cows were put in pasture at night, but kept up during the day. Half of the cows received an average each of 41 pounds of a mixture of green alfalfa, sorghum, and Johnson grass; the other half received each 3.4 pounds of cottonseed meal daily. The test lasted ten weeks. The cows getting the green feed gave an average daily yield of 14.9 pounds of milk; those getting the 3.4 pounds of cottonseed meal gave 14.2 pounds. This would indicate that the 41 pounds of green feed was a little more valuable than the 3.4 pounds of cottonseed meal. It will be noted that all of these cows were turned into a comparatively good pasture at night, and it is probable that the cows getting the cottonseed meal ate more than did those that had already eaten all the green feed wanted. The difference in favor of the soiling crop would, perhaps, have been much greater had the cows been kept off the pasture altogether.

3. Feeding large, medium, and small rations to dairy cows.—While it is probably true that most of the cows in this State suffer from a lack of sufficient food, it is also true that in some cases, at least, the cow is given more feed than she can make profitable use of. When this is the case the cost of the feed is not only larger than it should be, but the amount of milk may be decreased. To determine the best amount of grain feed to use, two tests were made. In the first test there were twenty-one cows, divided into three lots of seven cows each. The yield of milk from the cows varied from two to three gallons each per day. Lot 1 received 13 pounds of grain feed for each cow, consisting of a mixture of two parts of wheat bran and one part of cotton seed meal by weight; lot 2, 10 pounds; and lot 3, 6 pounds. The test lasted four weeks and the average weekly yield from lot 1 was 833 lbs. of milk; from lot 2, 873 pounds; and from lot 3, 743 pounds. Each of these lots were giving about equal amounts of milk before the test started. Where the cows received 10 pounds of grain feed they gave

as good results as where they were given a larger grain ration. Where only 6 pounds of the grain feed were given the cows decreased in the flow of milk and also lost some in body weight, showing that this amount was too small to meet the demands.

A second test was made with three lots of nine cows each. The experiment lasted four weeks. The grain mixture was the same as that given in the first test; that is, two parts of wheat bran and one part of cottonseed meal by weight. The cows in lot 1 received 11 pounds of grain daily; and lot 2, 9 pounds; and in lot 3, 7 pounds. All of the cows received in addition to the above, 8 pounds of Johnson grass hay and 14 pounds of cottonseed hulls. In this test, the cows in lot 2 gave a little better yield than did those in lot 1. The yield of milk from the cows in lot 3, as in the first test, was much smaller than in either of the other lots. From the results of these two experiments we may conclude that where cows are giving from two to three gallons of milk daily, 8 to 10 pounds of grain feed are as much as they can make profitable use of. We have found in practice that too much concentrated feed at or just after calving is more harmful to the cow than too little feed. Where the feed is increased too rapidly there is danger of the cow using it to put on fat, and when such is the case, as a rule, the amount of milk will decrease.

Every dairyman and farmer should observe carefully the effect of the feed on the yield of milk and learn to feed each individual cow the amount of feed that will give the greatest yield of milk at the least cost.

4. Value of corn silage as a feed for dairy cows.—In order to determine the value of corn silage as a feed for dairy cows, 30 cows were selected and fed for four periods of four weeks each.

During the first and fourth periods very little silage was fed, but during the second and third periods the cows were given all that they could eat up clean.

The results of this work are so important to the feeder at this time when the price of all feed stuffs are so high, that we give the following table showing the value of this feed:

VALUE OF CORN SILAGE AS A FEED FOR DAIRY COWS.

Number of Cows	Periods	TOTAL FEED EATEN					Total Value of Feed	Total Yield of Milk	Value of Milk at 16 $\frac{3}{4}$ c per Gallon	Profit over Cost of Feed
		Cottonseed Meal	Wheat Bran	Johnson Grass Hay	Cottonseed Hulls	Corn Silage				
	EIGHT WEEKS.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Dols.	Lbs.	Dols.	Dols.
30	1 and 4	5744	7818	8510	16570	9674	259.58	25046	485.33	225.75
30	2 and 3	5962	2273	1390	2080	64200	161.76	25098	486.45	324.69

In comparing the results we find that the yield of milk was about the same for both periods. It is then a question of the relative economy of the feeds used. The silage was used largely to replace the wheat bran, the cottonseed hulls, and the hay. Valuing the silage at \$2.00 per ton and the other feeds at the market value when fed, the cost of the feed for the first and fourth periods was \$259.58, and for the second and third periods it was \$161.76, or a difference of \$97.82 in favor of the periods when silage was fed liberally to replace other feeds.

The above would indicate that in less than two months the use of a silo with thirty cows would increase the profits about \$100.00.

Silage should be fed at least three months in each year and at this rate it would mean a saving of about \$150.00 for the above sized herd. On account of the original cost of the silo and the difficulties of keeping the silage where only a small quantity is needed daily, it is doubtful if a silo will pay with less than fifteen to twenty cows.

5. Protecting cows from hot sun in summer.—Our long summers and extreme heat of the sun no doubt is very trying on the cow that is giving a large quantity of milk. It must be remembered that such a cow is doing hard work. In order to determine whether or not it would be profitable to keep the cows in the barn during the day while it was hot, three experiments have been made. The first lasting 16 weeks; the second, 6 weeks; and the third, 10 weeks.

In the first trial, one-half of the cows were kept in the barn both night and day and given an average of about 44 pounds of soiling

crops daily. Half of the cows were allowed to run in the pasture both night and day, and in addition were given four pounds of cottonseed meal each day. The cows running on pasture gave about three pounds of milk each per day more than those that were kept in the barn. The cost of 100 pounds of milk was the same for both lots, or 29.8 cents.

In the second trial, the cows were divided into two equal lots. Both lots received three pounds of cottonseed meal per day for each cow, and one lot received in addition 48 pounds of green sorghum daily. The cows in the first lot ran in the pasture both night and day, while those in the second lot were turned in the pasture only at night. The cows that were turned in pasture both night and day, again gave the best results. They averaged nearly one-half a pound each more milk than did those that were kept in the barn during the day. The cost of 100 pounds of milk from the cows kept in the barn was 86.8 cents, while from those that were put on the pasture the cost was only 44 cents per 100 pounds.

In the third trial, all of the cows were given the same feed, consisting of a daily ration of 3.4 pounds of cottonseed meal. One-half of the cows were turned into the pasture only at night, while the others were put in pasture both day and night. The cows in lot 2, where they ran in pasture both day and night, produced nearly one pound more milk daily than when they were kept confined in the barn during the day. The cost of 100 pounds of milk where the cows were kept in the barn, was 38.4 cents; and in the lot running on pasture 34.6 cents.

Summing up the results of these three tests, we find that in no case was it advantageous to keep the cows in the barn during the day. There are probably two reasons for this: (1) there was a considerable amount of shade in the pasture, and (2) these cows that were kept in the barn had been used to going to pasture both night and day for the greater portion of the year and it was impossible to make them contented in the barn. Some of them refused to lie down at all during the day. It is probable that if they had become accustomed to staying in the barn that much better results could have been obtained by such protection. It is evident that so far as this experiment is concerned, it did not pay to keep the cows confined in the barn.

6. Influence of shelter for dairy cows.—The practice of allowing the cows to run out in the pasture both night and day during the winter months and in all kinds of weather is strongly condemned by most

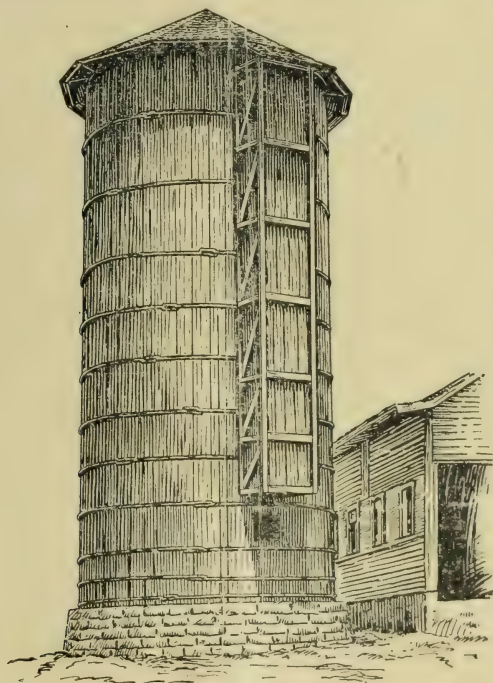
dairy authorities. In order to determine the extent of the injury by such a practice, we conducted an experiment during the month of February, 1906, with two lots of four cows each. Lot 1 was kept in the barn at night and during bad weather, while the cows in lot 2 were turned out both night and day except while being fed and milked. The average daily yield per cow for three weeks before the test began was 18 pounds of milk for each lot. The yield of milk from lot 1 during the test was 16.9 pounds daily and from lot 2, 18.4 pounds. The cows that were kept in the barn lost an average of 14 pounds each in live weight during the four weeks and those that were exposed gained an average of 3.5 pounds each. This test in itself would seem to indicate that shelter for cows is unnecessary in this State. A study of weather conditions, however, for the time that this test was carried on will show that February was extremely mild, with but little rain, and that it did not represent the average winter weather conditions. This test only shows that we often have weather conditions during the winter months when the cattle will do as well outside as when kept in the barn. It will be noted that the cows that were allowed to run in pasture both day and night gave more milk per day during the test than for the three weeks before the test began, although the feed was the same. This is probably due to the fact that the weather was more favorable during this time than it was before the test started.

Mississippi Agricultural Experiment Station.

BULLETIN NO. 112

SILAGE vs. HULLS AND MEAL

BY A. K. RISSER, Assistant in Dairy Farming Investigations,
AND R. R. WELCH, Agent in Dairying.



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SILAGE vs. HULLS AND MEAL

A. K. RISSEK AND R. R. WELCH.

During the past year the Dairy Division, Washington, D. C., in co-operation with the Mississippi Agricultural Experiment Station, has had a representative working with the dairymen of the State, instructing them in better dairy methods, helping them to raise the standard of their herds by weeding out the poor cows, in improving the quality of their product and thereby securing the best prices and giving suggestions and plans for dairy barns, dairy houses, and silos. Of those keeping individual records of cows, eight men have complete records of their herds for the year. One of these eight men had a silo, and it is the object of this Bulletin to present very briefly, the results of this herd fed on a silage ration as compared with the results of the other seven herds fed on the usual dairy ration of the South—hulls and meal.

PRODUCTION.

Dairymen who depend on pasture in summer and hulls and meal in winter, are usually doing only a summer business. During the winter months, November to February, their herds go into winter quarters and are frequently not paying for their keep, owing to the low average production in conjunction with a high average cost.

In the following table we compare the average production per cow per month, summer and winter, of seven herds containing 247 cows, with that of one herd of 23 cows. During the summer months May, June, and July, the cows of both groups were practically on the same ration, i. e., pasture supplemented with a little cotton seed meal. During the winter months, November, December, and January, the herd of 23 cows was fed on corn silage with cotton seed meal while the other herds were fed on hulls and cotton seed meal with the addition of some other feed, such as bran, shorts, alfalfa hay, etc.

MILK PRODUCTION.

	Cows.	Average production per Cow per month.				Decrease on Winter Ration.		Gain in Production due to Silage.
		Summer.		Winter.				
		Lbs.	Gals.	Lbs.	Gals.	Lbs.	Gals.	%
Dry Fed Herds	247	357.9	41.62	240.4	27.95	117.5	13.67	
Silage Fed Herd	23	364.9	42.43	335.9	39.05	29.0	3.38	
Differences.....		7.0	.81	95.5	11.10	88.5	10.29	36.81

From the table we learn that during the summer months, when the rations were about the same, the average production per cow per month for the two groups was almost the same; the average for the 23 cows being only .81 of a gallon above that of the 247 cows. During the winter months when the rations differed, the average production for the 247 cows dropped 117.5 pounds, or 13.67 gallons, while the average production of the 23 cows, fed on a silage ration, dropped only 29.0 pounds, or 3.38 gallons. Or, there is a net difference in favor of the silage ration of 88.5 pounds or 10.29 gallons per cow per month. Silage increased the production of the milk 36.81% or over one third.

Let us consider what this would amount to in the three winter months in a herd of 20 cows. Each cow would increase 10.29 gallons per month. For the 20 cows this would in one month amount to 205.8 gallons, and in three months would equal 617.4 gallons. The average price received per gallon for milk by the owners of these herds was not less than 30 cents; at 30 cents per gallon, the 205.8 gallons are worth \$185.22. Where is the excuse for sending our dairy herds into winter quarters when instead each cow could be earning a profit of \$3.09 per month?

BUTTER-FAT PRODUCTION.

In averaging the butter-fat production, several herds were omitted as the product was sold as whole milk and no records of butter fat production was made. We have, however, the average of 149 cows to compare with the average of the 23 cows.

BUTTER-FAT PRODUCTION.

	Cows.	Average butter-fat per Cow per month.		Decrease on Winter Ration.	Gain in Pro- duction due to Silage.
		SUMMER	WINTER		
		Lbs.	Lbs.	Lbs.	%
Dry Fed Herds	149	17.12	12.09	5.03	
Silage Fed Herd	23	17.58	16.70	.88	
Differences.....		.46	4.61	4.15	34.32

During the summer, the average production of butter-fat per cow of the two groups differed only by .46 pounds, while during the winter months, there is a net difference of 4.15 pounds in favor of the silage ration. Silage increased the production of butter-fat 34.32%, or one-third.

COST.

We have found a very pronounced gain in the production of both milk and butter-fat where silage was fed but before we draw our conclusions, let us compare the relative cost of the two rations. The dry ration, as previously stated, consisted principally of hulls and meal, with the addition of some other feeds, some feeding one kind, others another. The following are the rations fed during November, December and January, with the cost per ton for each kind of feed.

RATIONS.

Herd A:	AT PER TON.
3-6 lbs. Cotton Seed Meal.....	\$25.00
10-15 lbs. Hulls	6.25
Hay, occasionally, ...	8.00
Good cane pasture.	
Herd B:	
1½-2½ lbs. Cotton Seed Meal	\$23.50
14.6 lbs. Hulls	6.50
3-10.8 lbs. Bran	31.00
6-8 lbs. Alfalfa.....	20.00

Herd C:

AT PER TON.

4-6 lbs. Cotton Seed Meal	\$25.00
20 lbs. Hay	8.00

Herd D:

2-4 lbs. Cotton Seed Meal.....	\$28.00
4-10 lbs. Hulls	5.00
1-4 lbs. Bran	28.00
5-15 lbs. Hay	8.00

Herd E:

1½-2½ lbs. Cotton Seed Meal	\$24.00
10-25 lbs. Hulls	6.00
3-10 lbs. Corn Meal	30.00

or

2-10 lbs. Shorts	33.00
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Herd F:

3½-7 lbs. Cotton Seed Meal	\$23.60
15 lbs. Hulls	8.10
10 lbs. Hay.....	8.00
1 pint Molasses at 15c per gal.	

Herd G:

1½-6 lbs. Cotton Seed Meal	\$23.00
3½-13 lbs. Hulls	4.00
1-3 lbs. Bran	27.00
12 lbs. Hay	6.00

Silage-fed Herd:

1-5 lbs. Cotton Seed Meal	\$27.00
30-50 lbs. Silage	3.00
4 lbs. Shredded Fodder	10.00

The price of hulls in some cases appears low but most of the men had contracts with their dealers securing a special rate. The value put on corn silage, \$3.00 per ton, it should be noted, is very high. Silage does not ordinarily cost over \$1.50 per ton. The cost of the two rations is compared in the following table:

COST OF PRODUCTION.

	Cows.	Average Cost per Cow per Month.	Cost of produc- ing one Gallon Milk.	Cost of produc- ing one Pound Butter- Fat.	Reduction in Cost due to Silage Ration.
Dry Fed Herds	247	\$4.10	\$0.1468	\$0.2993	Milk, 39.03%
Silage Fed Herd	23	3.50	0.0895	0.2098	Butter-fat, 29.90%
Differences.....		\$0.60	\$0.0573	\$0.0895	

From the table we note that the dry ration cost 60c per month more than the silage ration, regardless of the fact that the silage is figured at \$3.00, and the hulls at about \$6.00 per ton.

. . The most interesting feature of the table, however, is the relative cost of producing a gallon of milk on the two rations. Silage reduced the cost of producing a gallon of milk 39.03%; almost half. The cost of producing a pound of butter-fat was reduced 29.90%; almost a third.

Returning to our herd of 20 cows, if these cows are put on a silage ration instead of on dry feed, we reduce the cost of feed per cow per month 60c. For the 20 cows this would in three months amount to \$36.00. Add this to the increased value of your production and we find that during the months of November, December and January, the man with a silo increases his profits on a herd of twenty cows by \$221.22 over the man who feeds without a silo. This amount would in a short time pay for a complete silo equipment.

This Experiment Station, through Bulletins and the Farmers' Institutes, has frequently advocated the silo and has offered some convincing results obtained with the Station herd. The results reported here, however, are not from the Station, but are from actual conditions as found on the farms of the State. A few years ago when good hulls, meal and bran were available at lower prices, there was a chance for a profit on a dry ration, but at the present prices of feeding

stuffs, care and judgment must be exercised in order to secure a profitable ration. For the economical production of either milk or butter fat the silo is indispensable.

THE SILO.

Anticipating some of the queries that will arise, we offer the following information for those who are interested:

Size.—A 90-ton silo, 14x30, will feed a herd of 25 cows six months, allowing 40 pounds per day to each cow. If your herd is smaller than 20 cows, the diameter of the silo should be reduced. There is no question as to whether silage can be used successfully in this climate but builders must be cautioned against using silos of too great diameter.

Wood or Concrete.—If your barn is a permanent structure and if you have access to cheap gravel and sand the concrete silo is to be recommended. It will cost about 25% more than the wood silo but it is durable, permanent, and does not require the attention that a wood silo demands. The best wood silo will, in a few years, need repairs, and then there is always the danger from storms. If you can get good lumber cheaply and if you might wish later to change the location of your buildings, then it may be wiser to build a wood silo. At the close of this paper we show the bills of quantities for both kinds of silos.

Crops for the Silo.—Corn is considered the best crop for the silo. If you can grow seven or more tons of corn to the acre, this crop is to be preferred. If you are not able to grow this amount of corn, then plant sorghum and cow peas, or sorghum and Soy beans. They generally make a heavy yield and can be grown anywhere in the State.

Machinery Necessary.—An eleven or thirteen inch cutter with elevator and an eight or ten horse-power engine are necessary. The cutters with blower elevator attachment are to be preferred, but the carrier style will do the work. The engine may in some communities be hired to do the job, and in this way the cash outlay can be reduced several hundred dollars.

How to Build the Silo.—If you decide to build either the wood or concrete silo, start getting your material together at once. Do not leave this part of the work until your crop is nearly ready to harvest.

If you have the mechanical ability, try building the silo yourself. The Department's representative in charge of this co-operative field work has had experience in building silos and if desired he will assist you in the work. If you are interested in the silo and wish further information, or if you wish to secure the services of the Department's expert along this line, address the Director of the Experiment Station, Agricultural College, Miss.

Bill of Quantities for 90-Ton Stave Silo:

FOUNDATION:

- 3 $\frac{3}{4}$ cubic yards rock.
- 2 cubic yards sand.
- 4 $\frac{1}{4}$ bbls. cement.

SILO PROPER - LUMBER:

- 133 pieces 2"x4"x16'.
- 133 pieces 2"x4"x14'.

HARDWARE:

- 8 rods $\frac{3}{4}$ inch diameter, 11 ft., 6 inches long;
- 8 rods $\frac{5}{8}$ inch diameter, 11 ft., 6 inches long;
- 20 rods $\frac{1}{2}$ inch diameter, 11 ft., 6 inches long;
- 18 malleable iron lugs;
- 50 pounds 40d spikes;
- 64 bolts $\frac{3}{8}$ inch, 4 inches long;
- 133 pieces galvanized sheet iron, No. 22, 2 inches wide by 4 $\frac{1}{4}$ in. long.

Bill of Quantities for 90-Ton Concrete Silo, 14x30:

- 38 bbls. cement;
- 17 cubic yards of sand;
- 29 cubic yards rock (gravel or brick bats).
- 538 ft., 30 inch fencing for re-inforcing;
- Lumber for forms and scaffolding.

Estimated Cost of a Complete Silo Equipment:

Materials for a 90-Ton Concrete Silo.....	\$160.00
11 inch cutter with blower elevator.....	100.00
8-HP. engine.....	350.00
Freight and extras.....	25.00
Total.....	\$635.00

Labor of building silo is not estimated.

Mississippi Agricultural Experiment Station

BULLETIN NO. 113.

JUNE, 1908.

COTTON EXPERIMENTS, 1907.

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BY W. R. PERKINS.

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**The Weather.**—The weather is always an important factor in crop production. The rain-fall may be of influence not only in furnishing the requisite amount of water for plants through the growing season; but excessive amounts may delay work, make soil conditions bad for crop growth, or greatly increase the labor necessary to cope with weeds and grass.

For these reasons a brief summary of weather conditions during the months of April, May, June, July, and August, follows:



Table I—Rain-fall for April, May, June, July, and August, 1907.

| Month,       | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9 | 10   | 11  | 12  | 13  | 14   | 15 | 16  | 17  | 18  | 19  | 20  | 21  | 22 | 23  | 24  | 25   | 26 | 27  | 28  | 29  | 30 | 31  | Total,<br>Inches |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|---|------|-----|-----|-----|------|----|-----|-----|-----|-----|-----|-----|----|-----|-----|------|----|-----|-----|-----|----|-----|------------------|
| April .....  |     |     |     |     | .48 |     | .1  |     |   |      |     |     |     |      |    | .40 | .91 | .41 | .25 | .75 | .05 |    |     |     |      |    |     |     |     |    |     | 5.56             |
| May .....    | T   | T   | .79 | .05 |     | .65 | .64 | .41 |   |      |     |     |     | 2.32 |    |     |     |     |     |     | .33 | T  |     |     | 2.95 |    | .41 |     | .38 |    | .1  | 9.06             |
| June .....   | .05 |     |     | T   |     |     |     |     |   |      | .90 |     |     | T    |    |     |     | .75 | .10 |     |     |    | .10 | .15 |      | .2 |     |     |     |    |     | 2.25             |
| July .....   |     | .75 |     |     |     |     |     |     | T |      | .10 | .20 | .40 |      |    |     |     |     |     |     |     |    |     |     |      |    | .40 | .16 | .56 |    | .16 | 2.64             |
| August ..... | .36 |     |     |     |     |     |     | T   |   | 1.42 | .90 |     |     |      |    |     |     |     |     |     |     |    |     |     | .56  |    | .33 |     |     |    |     | 3.57             |

T---Trace of Rain.

**Table II—Temperature, April, May, and June, 1907.**

| MONTH       | Minimum |       | Maximum |       | Mean<br>Minimum | Mean<br>Maximum | Average<br>Temperature |
|-------------|---------|-------|---------|-------|-----------------|-----------------|------------------------|
|             | Date    | Temp. | Date    | Temp. |                 |                 |                        |
| April ..... | 14      | 31°   | 7       | 83°   | 45.6°           | 70.4°           | 58°                    |
| May .....   | 28      | 45°   | 23      | 90°   | 57°             | 79.5°           | 68°                    |
| June .....  | 3       | 52°   | 22      | 94°   | 62.4°           | 89.2°           | 75.8°                  |

It will be seen by reference to the above summary that the weather in April was very cool, the temperature falling below the freezing point near the middle of the month, the 14th. The mean minimum temperature for the month was 45.6° and the average minimum and maximum temperatures was 58°. During May the temperature was nearer the normal for the month, but the rain-fall was excessive, being over nine inches.

The exceedingly cool month of April made the getting of a stand of cotton very difficult. The wet weather in May delayed the working and in some instances the planting of the cotton—all tending to make the crop very late.

#### VARIETIES OF COTTON.

In the test of varieties during the past year, the same precautions that we have heretofore observed in regard to distributing the different varieties over the field have been followed. The cotton was planted in one-row plots and repeated as often as possible. Twelve plots of each were grown this season.

The unfavorable weather conditions made the crop very backward during the spring, and the stand of cotton was also bad in most of the plots as indicated by the following estimate of per cent of stand of each variety: Cook's Improved, 89%; Toole's Improved, 98%; Cleveland Big Boll, 94%; Lewis Prize, 94%; Peterkin, 92%; World's Wonder, 85%; Tatum's Improved, 85%; Neely's Improved, 91%; King, 93%; Hastings' Mortgage Lifter, 86%; Russell Big Boll, 93%. The twelfth plot was planted in an unknown variety and is not given.

The following table gives the yield of cotton and other data from each plot as actually obtained without reference to the stand of plants.

Table III—Yield of Varieties of Cotton, 1907.

|                             | 1st Picking | 2nd Picking | Total Seed Cotton<br>per Plot | Total Seed Cotton<br>per Acre | Per Cent Lint | Weight Lint<br>per Acre | Weight Seed<br>per Acre | Value Lint, at 10c | Value Seed at<br>\$12 per ton | Total value<br>per Acre | Number of Seed in<br>1 lb. Seed Cotton | Number Bolls to Lb | Length of Staple<br>INCHES. |
|-----------------------------|-------------|-------------|-------------------------------|-------------------------------|---------------|-------------------------|-------------------------|--------------------|-------------------------------|-------------------------|----------------------------------------|--------------------|-----------------------------|
| 1. Cleveland Big Boll ..... | 188.5       | 30.5        | 219.0                         | 1752                          | 36            | 630                     | 1122                    | \$63.00            | \$ 6.73                       | \$69.73                 | 3620                                   | 59                 | 1 1-16                      |
| 2. Toole's Improved .....   | 172.0       | 33.0        | 205.0                         | 1640                          | 36            | 590                     | 1050                    | 59.00              | 6.30                          | 65.30                   | 4840                                   | 84                 | 1                           |
| 3. Cook's Improved .....    | 132.5       | 57.0        | 189.5                         | 1516                          | 37.5          | 568                     | 948                     | 56.80              | 5.68                          | 62.48                   | 3970                                   | 59                 | 15-16                       |
| 4. Russell Big Boll .....   | 181.0       | 47.5        | 228.5                         | 1828                          | 30.0          | 548                     | 1280                    | 54.80              | 7.68                          | 62.48                   | 3000                                   | 57                 | 1 1-8                       |
| 5. Peterkin .....           | 120.5       | 72.0        | 192.5                         | 1540                          | 34.5          | 531                     | 1009                    | 53.10              | 6.05                          | 59.15                   | 4460                                   | 80                 | 1 1-16                      |
| 6. Lewis Prize .....        | 152.5       | 45.5        | 198.0                         | 1584                          | 33.0          | 522                     | 1062                    | 52.20              | 6.37                          | 58.57                   | 4700                                   | 82                 | 1                           |
| 7. King .....               | 118.5       | 63.0        | 183.5                         | 1472                          | 34.0          | 500                     | 972                     | 50.00              | 5.83                          | 55.83                   | 4280                                   | 86                 | 15-16                       |
| 8. Tatum's Improved .....   | 156.5       | 27.5        | 184.0                         | 1468                          | 33.5          | 491                     | 977                     | 49.10              | 5.86                          | 54.96                   | 3050                                   | 91                 | 1                           |
| 9. Neely's Improved .....   | 139.0       | 43.0        | 182.0                         | 1456                          | 32.0          | 466                     | 990                     | 46.60              | 5.94                          | 52.54                   | 4350                                   | 57                 | 1 1-16                      |
| 10. Mortgage Lifter .....   | 113.0       | 38.5        | 151.5                         | 1212                          | 31.5          | 381                     | 831                     | 38.10              | 4.98                          | 43.08                   | 2810                                   | 52                 | 1 1-16                      |
| 11. World's Wonder .....    | 119.5       | 27.0        | 146.5                         | 1172                          | 32.0          | 375                     | 799                     | 37.50              | 4.80                          | 42.30                   | 3840                                   | 67                 | 1 1-8                       |

The crop could not be picked promptly and no very satisfactory conclusions could be drawn as to the date of maturing of the different varieties. Data in regard to size of bolls, size of seed, and per cent of lint can be obtained from the table.

Other varieties of cotton, including several long staple kinds, were grown, but owing to the late date of planting and to the unfavorable conditions the data obtained was not considered accurate enough to justify its publication.

**Topping Cotton.**—The effect of topping cotton on the yield is always a question about which inquiries are made. Two experiments on this subject were conducted in 1907.

The following results were obtained:

**Table IV—Cotton Topped August 3.**

|                  |          | Yield per Acre Seed Cotton |
|------------------|----------|----------------------------|
| Topped.....      | August 3 | 1808 pounds                |
| Not topped ..... |          | 1575 pounds                |

**Table V—Cotton Topped August 26.**

|                  |           | Yield per Acre Seed Cotton |
|------------------|-----------|----------------------------|
| Topped.....      | August 26 | 1780 pounds                |
| Not topped ..... |           | 1821 pounds                |

**Continued Late Plowing.**—The question of when to “lay by” or how late to plow cotton was tested in one experiment. One plot was plowed the last time on August 3 while the other was cultivated twice afterwards on the 13th and 27th of August. The effect on the crop was very apparent to the eye, the late-plowed rows continuing greener much later in the season and the number of late blossoms being much in excess of the others on this plot.

The land was a strong bottom soil, and the crop was very late. A good part of the cotton failed to open and the difference in actual yield was less than was expected from the appearance of the crop.



Table VI.

|                        |                       | Yield       |
|------------------------|-----------------------|-------------|
| Last Cultivation ..... | August 3              | 1126 pounds |
| Cultivated .....       | August 3, 13, and 26, | 1236 pounds |

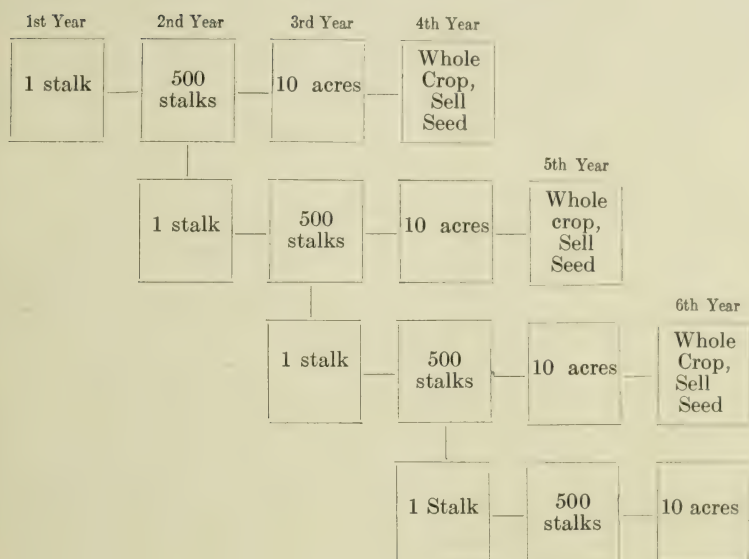
**Breeding Cotton.**—We have been doing some work on the improvement of cotton by selection. The work was begun in 1904, by selecting a few good stalks of Cook's Improved. These were planted the following year, the seed from each stalk being planted in a separate row in 1905.

The best stalks from these rows were saved for the next planting, and each put on a separate row as before. This has been kept up and the best stalks saved each year, till during 1907 the descendants from only three of the original stalks saved in 1904 were represented. With all this care and close selection, it might be thought that by this time the cotton would be so pure and uniform in its growth and appearance as to be considered a "pure bred" variety; but such is not the case. Considerable variation is still to be found in nature of growth of stalk, size and shape of bolls, and some variation in length of staple. It emphasized the importance of careful selection of seed and also suggests that it requires a number of years to eliminate the tendency to great variation.

The above method, however, is the best that has been suggested, being the same as followed by Professor Hays in the improvement of wheat and that is being practiced by others at the present time in the improvement of oats.

The idea is based upon finding among a great many plants one that is superior to the others or that possesses the qualities desired by the grower. This unusual individual is planted alone and the superior individual or individuals in its progeny selected, and so on each year. By careful selection and by giving uniform conditions of growth, good results should follow.

The following chart has been proposed by Dr. Webber for the breeding of cotton by a farmer:



In the fourth year after starting, all of the seed can be sold for planting purposes as the progeny of one stalk three years before, and your own crop planted from the 10-acre block from one stalk two years before. If this system should be followed, in a few years the result would be a uniform and pure variety of cotton. Its value as to yielding qualities, size of bolls, etc., would depend upon the judgment used in selecting the single mother plant each year.



Mississippi Agricultural Experiment Station.

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BULLETIN NO. 114.

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INSPECTION AND ANALYSES  
OF COTTON-SEED MEAL  
ON SALE IN MISSISSIPPI



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI,

NOVEMBER, 1908.



# MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.

BULLETIN No. 114.

COTTON-SEED MEAL INSPECTION

SEASON OF 1907-1908.

Chemical Department

OF THE

Mississippi Agricultural and Mechanical College.

|                       |                                            |
|-----------------------|--------------------------------------------|
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# INSPECTION AND ANALYSES OF COTTON-SEED MEAL

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MISSISSIPPI AGRICULTURAL AND MECHANICAL COLLEGE,  
DEPARTMENT OF CHEMISTRY.

November, 1908.

This bulletin summarizes the results of the inspection of cotton-seed meal for the season of 1907-1908. Inspectors have drawn samples of meal at practically every important point in the State. The greater number of these samples have been analyzed, and all of the results are now collected and published for the information of those interested in this trade. Some of the desirable effects predicted for the system of inspection inaugurated about two years ago are becoming apparent, and it is not too much to say that manufacturers of good meal rather welcome a careful investigation of the composition of their products. Evidence that greater care is now exercised in the manufacture as well as in the purchase of meal is not difficult to find. The skillful adulteration of good meal with finely ground hulls certainly placed at a great disadvantage the manufacturer who did not wish to engage in a business of this kind, as well as the farmer and feeder who were unable to determine with reasonable accuracy the extent of the adulteration without recourse to a chemical analysis. A business-like inspection, therefore, which imposes no unjust restrictions upon the manufacture and sale of an important commodity of this kind, and which does not affect in its details the general convenience of the trade, cannot but appeal successfully to manufacturers of high grade meal and to the intelligent farmer who, naturally, wishes, first of all, to assure himself of the quality of cotton-seed meal before contracting for its purchase.

**General effect of the inspection.**—The regular publication and discussion of the results of analyses of meal sold by each manufacturer doing business in the State supplies the information necessary for placing this trade upon a proper business basis. It is not practicable, as it is also not necessary, for a farmer to have an analysis made of a sample of all of the meal which he buys from time to time. The manufacturer must guarantee its quality as shown by the tag attached to each bag. The dealer and the farmer may easily determine whether this product is relatively worth the price asked by considering the

guaranty which the manufacturer makes. The **color** and general appearance of a sample of meal may not always indicate accurately its value as a fertilizer or as a feeding stuff. The **guaranty** considered in connection with **analyses** of the brand (or of the meal sold by the mill) as published in these bulletins serves as the only proper guide. The inspection establishes the fact, as pointed out later, that a contract based on the guaranteed analysis is safe, since it has been shown that samples drawn by inspectors are rarely deficient. This does not indicate, of course, that there is little or no difference in the quality of meals found on the market, for the low grade products necessarily carry a low guaranty. In the first place, therefore, the inspection supplies the trade with the information always essential in determining the relative values of the meals offered for sale in the State.

These bulletins containing analyses of samples of meal shipped by all mills should insure the fairness of competition between manufacturers; those who adjust their machinery to allow a rather large proportion of hulls to become admixed with meal cannot sell their product under a guarantee as high and as advantageous to the purchasers as those who are more careful to exclude large amounts of hulls. It is generally true, also, under present conditions, that the **price per pound** of the valuable constituents of a ton of meal is less in a high grade product. Reference to a succeeding paragraph will show the approximate differences in value between meals containing the minimum amount of nitrogen allowable under the three classifications in accordance with the law. The inspection operates in the second place, therefore, to render competition between the mills just and fair wherever meal is sold on its merits.

Dealers themselves, some of whom may be interested primarily in the profit in handling meal must necessarily come to consider more closely the guarantees and analyses in their own purchases, and the farmer should share in the advantage of buying the valuable constituents in meal at the lowest price per pound. By such a study both the merchant and farmer will come to understand better the composition of cotton-seed meal and its great value as a plant and animal food. This is one of the indirect but valuable effects of the inspection.

**General results of the inspection as shown by the tables of analyses.**—It should be gratifying to business and the public to note that very few shipments of meal were found, which were deficient to any considerable extent. This bulletin contains analyses of 414 samples drawn from all parts of the State and at different times throughout the season. Of these 49 samples (11.83 per cent.) were found to be below



the manufacturer's guaranty in nitrogen. Out of 242 analyses published last season, 23 (9.5 per cent.) were below the guaranty. During both seasons, however, these discrepancies were usually slight. Last year four samples were more than 5 per cent. below the guaranty, while the tables of analyses in this bulletin will show eight samples as much or more than 5% below.

Three shipments were found deficient to such an extent that the meal was attached in accordance with the authority of the fertilizer law. All of these shipments were made by one firm. The deficient samples will be found under Nos. 8191, 8192, 8042 and 8066.

In the main, however, the mills are making a successful effort to supply the trade with meal equal to or better in quality than that guaranteed. It is not a matter of great difficulty to do this, and the few mills which have made meal under their guaranties should be very careful during the coming season to adjust their machinery so that a greater margin of safety will be maintained. Mill owners throughout the State are becoming more familiar with the relation of the composition of cotton-seed meal to its value as a fertilizer and feeding stuff.

A few mills have registered their meal as "Standard Grade" (with a minimum guaranty of 4.95% nitrogen) while the samples drawn by inspectors and analyzed here show that a number of shipments contained enough nitrogen (6.18% or more) to allow the meal to be classified as "High Grade". These mills should take advantage of the higher classification.

**Method of inspection.**—Before offering cotton-seed meal for sale in the State, manufacturers must file a guaranty in the office of the State Chemist, and this guaranty establishes the minimum percentage of nitrogen which meal of that grade and brand must contain for the remainder of the season. This guaranty is stamped on the bags or printed on tags which are attached to them. Purchasers should invariably read this guaranty before buying. If they are not reasonably sure that the meal is as good as the guaranty, a sample may be drawn and sent to the State Laboratory for analysis free of charge. Such samples must be taken in the presence of disinterested witnesses, and in accordance with directions which the Department will supply.

Inspectors are sent to all parts of the State. Samples collected throughout the season are selected for analysis, the analytical work being equitably distributed over the territory and between the various mills. When analyses are completed, the results are communicated to the owner of the original consignment and also to the manufacturer.



of the meal. It is the object of the Department to make the inspection as efficient as possible.

**Relative values of different grades of meal.**—It is obvious that a manufacturer who guarantees his meal to contain 4.95 per cent. of nitrogen and expects it to carry only about that much should not receive and should not expect to receive as much per ton for his product as the manufacturer who supplies meal guaranteed to contain as much or more than 6.18% of nitrogen. The lower grade meal is made by the addition of hulls, and hulls should not sell at meal prices. This remains true whether the meal is intended for use as a feeding stuff or to be employed as a fertilizer, for the percentage of nitrogen practically determines its value in either case.

It is scarcely necessary to so often remind the purchaser that the value of a fertilizer depends primarily upon the amounts of Nitrogen, Phosphoric Acid, and Potash which it contains in a form available without difficulty for use as a food by plants. While meal containing no hulls whatever carries some potash and phosphoric acid in addition to the nitrogen, the latter is by far its most valuable constituent to the farmer and feeder. Hulls contain very little nitrogen and phosphoric acid and only a small amount of potash. It follows, therefore, that the percentage of nitrogen may be used as a satisfactory basis for comparing the approximate relative values of meals of different grades. Some meal is sold in the State which is guaranteed to contain only 3.50 per cent. of nitrogen. This cannot be worth nearly so much per ton, of course, as the "Standard Grade" meals which must contain at least 4.95 per cent. or the "High Grade" meals carrying a minimum of 6.18 per cent.

If we assume that available nitrogen in any form costs the farmer 20 cents a pound at the beginning of the season, we may determine the approximate relative values of the three grades of meal given below as follows:

|                             | HIGH GRADE | ST'D. GRADE | OFF GRADE |
|-----------------------------|------------|-------------|-----------|
|                             | MEAL.      | MEAL.       | MEAL.     |
| Percentage of Nitrogen..... | 6.18       | 4.95        | 3.50      |
| Pounds of Nitrogen in 1 ton | 123.60     | 99.00       | 70.00     |
| Value at 20c per lb. ....   | \$24.72    | \$19.80     | \$14.00   |

The above examples are sufficient to bring out clearly the fact that there should be a considerable difference in the prices asked for meals of the grades given. It is not sufficient simply for the purchaser to assume that he is protecting himself by paying one or two dollars

less per ton for standard than for high grade meal. A simple computation will enable him to determine, at least with satisfactory approximation, the relative values of meals which may be offered for sale. This is a matter which should receive the fullest attention of the trade. The analyses given in the tables which follow will enable the dealer and farmer to buy cotton-seed meal in an intelligent way. The somewhat haphazard methods in use prior to the enactment of the law need not be continued, now that all fertilizers and feeding stuffs may be bought on the basis of the valuable constituents contained in them.

**Classification of cotton-seed meal.**—The law requires that all cotton-seed meal be guaranteed, branded, and sold under the following classifications:

- (1) **High grade cotton-seed meal** which must be guaranteed to contain at least 6.18% nitrogen, equivalent to 7.50% of ammonia.
- (2) **Standard grade cotton-seed meal** which must be guaranteed to contain at least 4.95% nitrogen, equivalent to 6.00% of ammonia.
- (3) **Off grade cotton-seed meal** which is guaranteed to contain less than 4.95% of nitrogen.

**Valuations.**—The valuations given here are based on nitrogen only. When these are considered in connection with what has been said in regard to the use of meal, the figures will give a very good idea of the relative values of the various meals represented by the samples analyzed. If an analysis shows a sample to contain 6.50 per cent. (6.5 lb. in 100 lbs. meal) of nitrogen, a ton of the meal will contain 130 lbs. ( $6.50 \times 20$ ). At 20c a pound, 130 pounds of nitrogen will be worth \$26.00. If another sample shows 7.00 per cent. of nitrogen on analysis, a ton will contain 140 lbs. worth \$28.00 at 20c a pound. These valuations are inserted merely to assist those purchasers who do not properly understand the relation of an analysis to the actual value of the meal.

**Cotton-seed meal for feeding.**—Cotton-seed meal is one of the most valuable and plentiful of the concentrated feeds. It is also one of the richest of the protein feeds, and protein is the most expensive constituents of any feeding stuff. The proteids taken collectively are estimated by multiplying the percentage of nitrogen by 6.25. Low grade meals carrying a small amount of nitrogen are, therefore, just as unsatisfactory for feeding animals as for nourishing plants, because in either case the nitrogen determines most largely the value of the meal.

As a feeding stuff it may be assumed with safety that **one** pound of meal is about equal to **two** pounds of corn meal.

**Indirect use of cotton-seed meal as a fertilizer.**—It is not a difficult matter to show that the direct application of meal to the soil is wasteful. Experiments have repeatedly demonstrated that fully 80–88 per cent. of the fertilizer value of feeding stuffs may be recovered in the manure. If one pound of cotton-seed meal will produce practically as much milk, butter, or beef as two pounds of corn meal, and, if after feeding it, we may recover for the farm in the manure even 50% of the fertilizer value of the original meal, the practice of applying meal to the soil cannot be said to be a wise one in any permanent system of agriculture, since such a procedure necessarily involves a practical waste of the feeding value of the meal.

The value of the fertilizer constituents in a ton of meal on the basis of present valuations, may be computed as shown in the following illustration in which meal of good quality is used.

| Fertilizer Constituents  | Per Cent-<br>age in<br>Meal | No. of Lbs<br>in 100<br>Lbs Meal | No. Lbs in<br>One Ton<br>Meal | Value Per<br>Pound | Value Per<br>Ton |
|--------------------------|-----------------------------|----------------------------------|-------------------------------|--------------------|------------------|
| Nitrogen .....           | 6.79                        | 6.79                             | 135.80                        | 20c                | \$ 27.16         |
| Phosphoric<br>Acid ..... | 2.88                        | 2.88                             | 57.60                         | 5c                 | 2.88             |
| Potash .....             | 1.77                        | 1.77                             | 35.40                         | 5 $\frac{3}{4}$ c  | 2.03             |
| Totals.....              |                             | 11.44                            | 228.80                        |                    | \$32.07          |

If we assume that we may carry back to the land in manure even 50% of the fertilizer constituents of feed consumed by animals, the manure resulting from a ton of good meal will be worth approximately \$16.00 for each ton of dry matter contained in it. In the same way, and on the basis of 50% recovery, it may be computed that we should find the fertilizer constituents in the manure from a ton of cotton-seed worth approximately \$7.50.

**Relation between the fertilizer value of cotton-seed meal and the fertilizer value of cotton-seed.**—By substituting the average percentage of fertilizer constituents in cotton-seed in the illustrations given of the method of calculating the fertilizer value of cotton-seed meal, it will be found that the fertilizer constituents in a ton of seed are worth \$15.03. It has been demonstrated that, pound for pound, the valuable constituents of the meal are just as effective as the same constituents contained in the seed. The oil in seed possesses **no value**

**whatever** as a fertilizer. Consequently all of the oil is **wasted** when seed is used as a fertilizer. We may safely assume that 950 to 1,000 lbs. good meal will contain as much plant food and will give as good crop returns as 2,000 lbs. of average seed when both the meal and the seed are properly "balanced" by the addition of the necessary amounts of acid phosphate or of acid phosphate and potash salts.



| Laboratory Number. | Name of Brand and Manufacturer.                                 | Where and from Whom Collected.                         |
|--------------------|-----------------------------------------------------------------|--------------------------------------------------------|
|                    | ABERDEEN OIL & ICE Co.,<br>Aberdeen, Miss.                      |                                                        |
| 8374               | H. G. Cottonseed Meal.....                                      | Aberdeen Oil & Ice Co., Aberdeen.....                  |
| 8375               | H. G. Cottonseed Meal.....                                      | Aberdeen Oil & Ice Co., Aberdeen.....                  |
|                    | ALABAMA COTTON OIL Co.,<br>Mobile, Ala.                         |                                                        |
| 8376               | H. G. Cottonseed Meal.....                                      | J. T. Mitchell, Union.....                             |
| 8757               | H. G. Cottonseed Meal.....                                      | A. G. Delmas, Scranton.....                            |
| 8758               | H. G. Cottonseed Meal.....                                      | T. V. Courtenay, Pass Christian.....                   |
|                    | ANGUILLA OIL & GIN Co.,<br>Anguilla, Miss.                      |                                                        |
| 8759               | H. G. Cottonseed Meal.....                                      | Anguilla Oil & Gin Co., Anguilla....                   |
|                    | ARCOLA COTTON OIL Co.,<br>Arcola, Miss.                         |                                                        |
| 8377               | H. G. Cottonseed Meal.....                                      | Threefoot Bros. & Co., Meridian.....                   |
| 8760               | H. G. Cottonseed Meal.....                                      | Arcola Cotton Oil Co., Arcola.....                     |
|                    | BANNER COTTON OIL Co.,<br>Kentwood, La.                         |                                                        |
| 8378               | S. G. Cottonseed Meal.....                                      | J. L. Moyse & Bro., Summit.....                        |
|                    | BARBER & LEWIS OIL Co.,<br>Edwards, Miss.                       |                                                        |
| 8379               | H. G. Cottonseed Meal.....                                      | C. A. Williams, Brandon.....                           |
| 8381               | H. G. Cottonseed Meal.....                                      | Watts Merc. Co., Sandersville.....                     |
| 8382               | H. G. Cottonseed Meal.....                                      | L. Funkens' ein, Meridian.....                         |
| 8383               | H. G. Cottonseed Meal.....                                      | McMullan & Sons, Hickory.....                          |
| 8384               | H. G. Cottonseed Meal.....                                      | J. L. Wells, Hickory.....                              |
| 8385               | H. G. Cottonseed Meal.....                                      | Gulfport Roller Mills, Gulfport.....                   |
| 8386               | H. G. Cottonseed Meal.....                                      | W. J. Bell, Trenton.....                               |
| 8761               | H. G. Cottonseed Meal.....                                      | Gulfport Grocery Company, Gulfport                     |
| 8762               | H. G. Cottonseed Meal.....                                      | Gulfport Roller Mills, Gulfport.....                   |
| 8763               | H. G. Cottonseed Meal.....                                      | Biloxi Milling Co., Biloxi.....                        |
| 8764               | H. G. Cottonseed Meal.....                                      | D. Carven Merc. Co., Bay St. Louis...                  |
| 8765               | H. G. Cottonseed Meal.....                                      | C. J. Edwards, Vicksburg.....                          |
| 8380               | S. G. Cottonseed Meal.....                                      | Barber & Lewis Oil Co., Edwards.....                   |
|                    | BARLOW OIL MILL,<br>Barlow, Miss.                               |                                                        |
| 8599               | H. G. Cottonseed Meal.....                                      | Barlow Oil Mill, Barlow.....                           |
|                    | F. W. BRODE & COMPANY,<br>Memphis, Tenn.                        |                                                        |
| 8387               | H. G. Cottonseed Meal.....                                      | Kennedy & Company, Wiggins.....                        |
|                    | BROOKHAVEN COTTON OIL<br>& FERTILIZER Co.,<br>Brookhaven, Miss. |                                                        |
| 8388               | H. G. Cottonseed Meal.....                                      | Brookhaven Cotton Oil & Fert. Co.,<br>Brookhaven ..... |
| 8389               | H. G. Cottonseed Meal.....                                      | Brookhaven Cotton Oil & Fert. Co.,<br>Brookhaven ..... |
| 8390               | H. G. Cottonseed Meal.....                                      | Lampton & Rawls Co., Silver Creek....                  |
| 8391               | H. G. Cottonseed Meal.....                                      | D. C. Griffith & Co., Silver Creek.....                |
| 8392               | H. G. Cottonseed Meal.....                                      | A. C. Seavey & Sons, Brookhaven.....                   |
| 8393               | H. G. Cottonseed Meal.....                                      | Brookhaven Cot. Oil & Fert. Co., Osyka                 |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8374               | 6.65               | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | \$ 26.80                      | \$ 24.72                                    |
| 8375               | 7.51               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 8376               | 8.63               | 5.90               | 7.16                                          | 6.18                 | 7.50                                               | 23.60                         | 24.72                                       |
| 8757               | 9.52               | 6.24               | 7.58                                          | 6.18                 | 7.50                                               | 24.96                         | 24.72                                       |
| 8758               | 8.62               | 6.30               | 7.65                                          | 6.18                 | 7.50                                               | 25.20                         | 24.72                                       |
| 8759               | 6.20               | 5.92               | 7.19                                          | 6.18                 | 7.50                                               | 23.68                         | 24.72                                       |
| 8377               | 6.98               | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8760               | 7.30               | 6.79               | 8.24                                          | 6.18                 | 7.50                                               | 27.16                         | 24.72                                       |
| 8378               | 7.83               | 6.99               | 8.49                                          | 4.95                 | 6.01                                               | 27.96                         | 19.80                                       |
| 8379               | 7.74               | 6.19               | 7.51                                          | 6.18                 | 7.50                                               | 24.76                         | 24.72                                       |
| 8381               | 8.82               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8382               | 9.37               | 6.14               | 7.45                                          | 6.18                 | 7.50                                               | 24.56                         | 24.72                                       |
| 8383               | 9.60               | 6.19               | 7.51                                          | 6.18                 | 7.50                                               | 24.76                         | 24.72                                       |
| 8384               | 9.59               | 6.28               | 7.62                                          | 6.18                 | 7.50                                               | 25.12                         | 24.72                                       |
| 8385               | 9.52               | 6.29               | 7.64                                          | 6.18                 | 7.50                                               | 25.16                         | 24.72                                       |
| 8386               | 9.58               | 6.08               | 7.38                                          | 6.18                 | 7.50                                               | 24.32                         | 24.72                                       |
| 8761               | 9.16               | 5.92               | 7.19                                          | 6.18                 | 7.50                                               | 23.68                         | 24.72                                       |
| 8762               | 9.45               | 5.89               | 7.15                                          | 6.18                 | 7.50                                               | 23.56                         | 24.72                                       |
| 8763               | 9.08               | 5.95               | 7.22                                          | 6.18                 | 7.50                                               | 23.80                         | 24.72                                       |
| 8764               | 10.14              | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8765               | 9.20               | 5.77               | 7.00                                          | 6.18                 | 7.50                                               | 23.08                         | 24.72                                       |
| 8380               | 7.45               | 6.16               | 7.48                                          | 4.95                 | 6.01                                               | 24.64                         | 19.80                                       |
| 8599               | 7.15               | 7.28               | 8.84                                          | 6.20                 | 7.53                                               | 29.12                         | 24.80                                       |
| 8387               | 8.27               | 6.76               | 8.21                                          | 6.18                 | 7.50                                               | 27.04                         | 24.72                                       |
| 8388               | 7.52               | 6.72               | 8.16                                          | 6.20                 | 7.53                                               | 26.88                         | 24.80                                       |
| 8389               | 6.26               | 6.03               | 7.32                                          | 6.20                 | 7.53                                               | 24.12                         | 24.80                                       |
| 8390               | 7.97               | 6.27               | 7.61                                          | 6.20                 | 7.53                                               | 25.08                         | 24.80                                       |
| 8391               | 8.27               | 6.05               | 7.34                                          | 6.20                 | 7.53                                               | 24.20                         | 24.80                                       |
| 8392               | 6.68               | 6.57               | 7.98                                          | 6.20                 | 7.53                                               | 26.28                         | 24.80                                       |
| 8393               | 7.07               | 6.68               | 8.11                                          | 6.20                 | 7.53                                               | 26.72                         | 24.80                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                  |
|--------------------|---------------------------------------------------------|-------------------------------------------------|
| 8394               | H. G. Cottonseed Meal.....                              | Brookhaven Cot. Oil & Fert Co., Osyka           |
| 8395               | H. G. Cottonseed Meal.....                              | Rawls, Lampton & Co., Silver Creek....          |
| 8396               | H. G. Cottonseed Meal.....                              | Hudson & Co., Sumrall.....                      |
| 8766               | H. G. Cottonseed Meal.....                              | Louis Cohn & Sons, Brookhaven.....              |
| 8767               | H. G. Cottonseed Meal.....                              | John McGrath & Sons, Brookhaven....             |
| 8768               | H. G. Cottonseed Meal.....                              | John McGrath & Sons, Brookhaven....             |
|                    | BUCKEYE COTTON OIL Co.,<br>Jackson, Miss.               |                                                 |
| 8397               | H. G. Cottonseed Meal.....                              | A. M. Stones, Greenwood.....                    |
| 8398               | H. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Greenwood....           |
| 8399               | H. G. Cottonseed Meal.....                              | J. L. Hammonds, Kosciusko.....                  |
| 8400               | H. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Greenwood....           |
| 8401               | H. G. Cottonseed Meal.....                              | J. J. Barry, New Hebron.....                    |
| 8402               | H. G. Cottonseed Meal.....                              | Fernwood Lumber Co., Fernwood.....              |
| 8403               | H. G. Cottonseed Meal.....                              | Osyka Merc. Co., Osyka.....                     |
| 8404               | H. G. Cottonseed Meal.....                              | Gaddis-McLaurin Co., Raymond.....               |
| 8405               | H. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Jackson.....            |
| 8406               | H. G. Cottonseed Meal.....                              | Hyman Merc. Co., Summit.....                    |
| 8407               | H. G. Cottonseed Meal.....                              | J. M. Kelley, Gandsi.....                       |
| 8408               | H. G. Cottonseed Meal.....                              | Kennedy & Co., Wiggins.....                     |
| 8409               | H. G. Cottonseed Meal.....                              | Hattiesburg Grocery Co., Hattiesburg            |
| 8410               | H. G. Cottonseed Meal.....                              | Hawkins & Co., Hattiesburg.....                 |
| 8411               | H. G. Cottonseed Meal.....                              | T. B. Gaddis, Morton.....                       |
| 8769               | H. G. Cottonseed Meal.....                              | G. H. Pond, Collins.....                        |
| 8770               | H. G. Cottonseed Meal.....                              | Holloway & McRaney, Collins.....                |
| 8771               | H. G. Cottonseed Meal.....                              | R. Watts & Co., Seminary.....                   |
| 8772               | H. G. Cottonseed Meal.....                              | Kennedy & Co., Wiggins.....                     |
| 8773               | H. G. Cottonseed Meal.....                              | G. D. Moseley, Summerland.....                  |
| 8774               | H. G. Cottonseed Meal.....                              | Hawkins & Co., Hattiesburg.....                 |
| 8775               | H. G. Cottonseed Meal.....                              | W. M. Conner, Hattiesburg.....                  |
| 8776               | H. G. Cottonseed Meal.....                              | The Rankin Co., Columbia.....                   |
| 8777               | H. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Jackson.....            |
| 8779               | H. G. Cottonseed Meal.....                              | Farmers Warehouse & Gin Co.,<br>New Hebron..... |
| 8780               | H. G. Cottonseed Meal.....                              | H. B. Lewis & Co., Columbia.....                |
| 8781               | H. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Greenwood....           |
| 8778               | O. G. Cottonseed Meal.....                              | Buckeye Cotton Oil Co., Jackson.....            |
|                    | BUTLER-KEYSER OIL & FERT.<br>COMPANY,<br>Fayette, Miss. |                                                 |
| 8412               | S. G. Cottonseed Meal.....                              | Butler-Kyser Oil & Fert. Co., Fayette           |
| 8413               | S. G. Cottonseed Meal.....                              | Butler-Kyser Oil & Fert. Co., Fayette           |
| 8782               | S. G. Cottonseed Meal.....                              | Butler-Kyser Oil & Fert. Co., Fayette           |
|                    | CANTON OIL MILL COMPANY,<br>Canton, Miss.               |                                                 |
| 8414               | H. G. Cottonseed Meal.....                              | Canton Oil Mill Co., Canton.....                |
| 8415               | H. G. Cottonseed Meal.....                              | Canton Oil Mill Co., Canton.....                |
|                    | CENTREVILLE COT. OIL Co.,<br>Centreville, Miss.         |                                                 |
| 8429               | S. G. Cottonseed Meal.....                              | Centreville Cotton Oil Co., Centreville         |
| 8430               | S. G. Cottonseed Meal.....                              | Ford Bros. & Company, Centreville....           |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8394               | 7.21               | 6.38               | 7.75                                          | 6.20                 | 7.53                                               | \$ 25.52                      | \$ 24.80                                    |
| 8395               | 7.82               | 6.18               | 7.50                                          | 6.20                 | 7.53                                               | 24.72                         | 24.80                                       |
| 8396               | 7.60               | 6.32               | 7.67                                          | 6.20                 | 7.53                                               | 25.28                         | 24.80                                       |
| 8766               | 8.26               | 6.42               | 7.79                                          | 6.20                 | 7.53                                               | 25.68                         | 24.80                                       |
| 8767               | 7.63               | 6.37               | 7.73                                          | 6.20                 | 7.53                                               | 25.48                         | 24.80                                       |
| 8768               | 7.68               | 6.30               | 7.65                                          | 6.20                 | 7.53                                               | 25.20                         | 24.80                                       |
| 8397               | 7.69               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | 26.56                         | 24.72                                       |
| 8398               | 7.60               | 6.76               | 8.21                                          | 6.18                 | 7.50                                               | 27.04                         | 24.72                                       |
| 8399               | 8.01               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | 26.56                         | 24.72                                       |
| 8400               | 8.65               | 6.50               | 7.89                                          | 6.18                 | 7.50                                               | 26.00                         | 24.72                                       |
| 8401               | 8.16               | 6.76               | 8.21                                          | 6.18                 | 7.50                                               | 27.04                         | 24.72                                       |
| 8402               | 10.34              | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | 26.80                         | 24.72                                       |
| 8403               | 8.42               | 6.89               | 8.36                                          | 6.18                 | 7.50                                               | 27.56                         | 24.72                                       |
| 8404               | 7.49               | 6.74               | 8.18                                          | 6.18                 | 7.50                                               | 26.96                         | 24.72                                       |
| 8405               | 7.59               | 6.44               | 7.82                                          | 6.18                 | 7.50                                               | 25.76                         | 24.72                                       |
| 8406               | 8.03               | 6.60               | 8.01                                          | 6.18                 | 7.50                                               | 26.40                         | 24.72                                       |
| 8407               | 7.85               | 6.74               | 8.18                                          | 6.18                 | 7.50                                               | 26.96                         | 24.72                                       |
| 8408               | 8.71               | 6.62               | 8.04                                          | 6.18                 | 7.50                                               | 26.48                         | 24.72                                       |
| 8409               | 9.46               | 6.43               | 7.81                                          | 6.18                 | 7.50                                               | 25.72                         | 24.72                                       |
| 8410               | 9.48               | 6.62               | 8.04                                          | 6.18                 | 7.50                                               | 26.48                         | 24.72                                       |
| 8411               | 8.88               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8769               | 7.81               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | 26.32                         | 24.72                                       |
| 8770               | 8.38               | 6.43               | 7.81                                          | 6.18                 | 7.50                                               | 25.72                         | 24.72                                       |
| 8771               | 7.89               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8772               | 9.25               | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8773               | 7.66               | 6.87               | 8.34                                          | 6.18                 | 7.50                                               | 27.48                         | 24.72                                       |
| 8774               | 9.17               | 6.27               | 7.61                                          | 6.18                 | 7.50                                               | 25.08                         | 24.72                                       |
| 8775               | 7.98               | 6.49               | 7.88                                          | 6.18                 | 7.50                                               | 25.96                         | 24.72                                       |
| 8776               | 7.10               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 8777               | 7.69               | 6.47               | 7.85                                          | 6.18                 | 7.50                                               | 25.88                         | 24.72                                       |
| 8779               | 7.93               | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | 26.80                         | 24.72                                       |
| 8780               | 7.67               | 6.37               | 7.73                                          | 6.18                 | 7.50                                               | 25.48                         | 24.72                                       |
| 8781               | 8.64               | 6.52               | 7.92                                          | 6.18                 | 7.50                                               | 26.08                         | 24.72                                       |
| 8778               | 7.96               | 4.78               | 5.80                                          | 3.70                 | 4.49                                               | 19.12                         | 14.80                                       |
| .                  |                    |                    |                                               |                      |                                                    |                               |                                             |
| .                  |                    |                    |                                               |                      |                                                    |                               |                                             |
| 8412               | 9.46               | 5.93               | 7.20                                          | 4.95                 | 6.01                                               | 23.72                         | 19.80                                       |
| 8413               | 9.31               | 5.92               | 7.19                                          | 4.95                 | 6.01                                               | 23.68                         | 19.80                                       |
| 8782               | 9.80               | 6.09               | 7.39                                          | 4.95                 | 6.01                                               | 24.36                         | 19.80                                       |
| 8414               | 8.20               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                       |
| 8415               | 7.77               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 8429               | 6.91               | 6.72               | 8.16                                          | 5.00                 | 6.07                                               | 26.88                         | 20.00*                                      |
| 8430               | 7.33               | 6.56               | 7.96                                          | 5.00                 | 6.07                                               | 26.24                         | 20.00                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                                                                              | Where and from Whom Collected.                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| 8783               | S. G. Cottonseed Meal .....<br>CENTRAL COTTON OIL CO.,<br>Jackson, Miss.                                     | Ford Bros. & Company, Centreville....                                 |
| 8422               | H. G. Cottonseed Meal.....                                                                                   | T. S. Turner, Canton.....                                             |
| 8423               | H. G. Cottonseed Meal.....                                                                                   | Central Cotton Oil Co., Jackson.....                                  |
| 8424               | H. G. Cottonseed Meal.....                                                                                   | Central Cotton Oil Co., Jackson.....                                  |
| 8425               | H. G. Cottonseed Meal.....                                                                                   | Central Cotton Oil Co., Jackson.....                                  |
| 8426               | H. G. Cottonseed Meal.....                                                                                   | Summit Merc. Co., Summit.....                                         |
| 8427               | H. G. Cottonseed Meal.....                                                                                   | J. L. Moyse & Bro., Summit.....                                       |
| 8428               | H. G. Cottonseed Meal.....                                                                                   | T. C. Ruble, McHenry.....                                             |
| 8784               | H. G. Cottonseed Meal.....                                                                                   | Holloway & McRaney, Collins.....                                      |
| 8785               | H. G. Cottonseed Meal.....                                                                                   | Sumrall Merc. Co., Sumrall.....                                       |
| 8786               | H. G. Cottonseed Meal.....                                                                                   | Central Cotton Oil Co., Jackson.....                                  |
| 8787               | H. G. Cottonseed Meal.....                                                                                   | W. H. Joyner, Forest.....                                             |
| 8788               | H. G. Cottonseed Meal.....<br>CLAY COUNTY COTTON OIL CO.<br>West Point, Miss.                                | D. C. Griffith & Co., Silver Creek.....                               |
| 8416               | H. G. Cottonseed Meal.....                                                                                   | Clay County Cotton Oil Co., West Point                                |
| 8417               | H. G. Cottonseed Meal.....                                                                                   | Clay County Cotton Oil Co., West Point                                |
| 8418               | H. G. Cottonseed Meal.....                                                                                   | A. J. Lyons & Co., Meridian.....                                      |
| 8419               | H. G. Cottonseed Meal.....                                                                                   | Harris & Company, Meridian.....                                       |
| 8420               | H. G. Cottonseed Meal.....                                                                                   | L. Funkenstein, Meridian.....                                         |
| 8421               | H. G. Cottonseed Meal.....                                                                                   | J. J. Gaines, Decatur.....                                            |
| 8789               | H. G. Cottonseed Meal.....                                                                                   | Clay County Cotton Oil Co., West Point                                |
| 8790               | H. G. Cottonseed Meal.....                                                                                   | Gulfpport Grocery Co., Gulfpport.....                                 |
| 8791               | H. G. Cottonseed Meal.....                                                                                   | Harris & Company, Meridian.....                                       |
| 8792               | H. G. Cottonseed Meal.....<br>COLDWATER COTTON OIL CO.,<br>Coldwater, Miss.                                  | O. L. Shaw, Ackerman.....                                             |
| 8431               | H. G. Cottonseed Meal.....                                                                                   | Hudson Bros., Hernando.....                                           |
| 8432               | H. G. Cottonseed Meal.....                                                                                   | Coldwater Cotton Oil Co., Coldwater...                                |
| 8433               | H. G. Cottonseed Meal.....                                                                                   | Coldwater Cotton Oil Co., Coldwater                                   |
| 8793               | H. G. Cottonseed Meal.....<br>CORINTH COTTON OIL CO.,<br>Corinth, Miss.                                      | Coldwater Cotton Oil Co., Coldwater                                   |
| 8434               | H. G. Cottonseed Meal.....<br>CRYSTAL SPRINGS OIL MILL,<br>FERT. & M'F'G. COMPANY,<br>Crystal Springs, Miss. | C. A. Turner, Corinth.....                                            |
| 8435               | H. G. Cottonseed Meal.....                                                                                   | Lotterhos & Huber Co., Crystal Sp'gs.                                 |
| 8436               | H. G. Cottonseed Meal.....                                                                                   | Crystal Springs Oil Mill, Fert. & M'f'g.<br>Co., Crystal Springs..... |
| 8437               | H. G. Cottonseed Meal.....<br>DELTA OIL COMPANY,<br>Greenville, Miss.                                        | Lotterhos & Huber Co., Crystal Sp'gs.                                 |
| 8438               | S. G. Cottonseed Meal.....                                                                                   | Delta Oil Company, Greenville.....                                    |
| 8358               | S. G. Cottonseed Meal.....<br>DESOTO OIL COMPANY,<br>Greenville, Miss.                                       | Experiment Station, Stoneville.....                                   |
| 8439               | S. G. Cottonseed Meal.....                                                                                   | DeSoto Oil Company, Greenville.....                                   |
| 8440               | S. G. Cottonseed Meal.....                                                                                   | V. P. Still & Son, Senatobia.....                                     |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8783               | 7.57               | 6.58               | 7.99                                          | 5.00                 | 6.07                                               | \$ 26.32                      | \$ 20.00                                    |
| 8422               | 8.35               | 6.43               | 7.81                                          | 6.18                 | 7.50                                               | 25.72                         | 24.72                                       |
| 8423               | 8.39               | 6.50               | 7.89                                          | 6.18                 | 7.50                                               | 26.00                         | 24.72                                       |
| 8424               | 8.28               | 6.52               | 7.92                                          | 6.18                 | 7.50                                               | 26.08                         | 24.72                                       |
| 8425               | 8.28               | 6.42               | 7.79                                          | 6.18                 | 7.50                                               | 25.68                         | 24.72                                       |
| 8426               | 8.29               | 6.29               | 7.64                                          | 6.18                 | 7.50                                               | 25.16                         | 24.72                                       |
| 8427               | 8.99               | 6.82               | 8.28                                          | 6.18                 | 7.50                                               | 27.28                         | 24.72                                       |
| 8428               | 8.41               | 6.49               | 7.88                                          | 6.18                 | 7.50                                               | 25.96                         | 24.72                                       |
| 8784               | 7.20               | 6.37               | 7.73                                          | 6.18                 | 7.50                                               | 25.48                         | 24.72                                       |
| 8785               | 8.67               | 6.44               | 7.82                                          | 6.18                 | 7.50                                               | 25.76                         | 24.72                                       |
| 8786               | 9.03               | 6.37               | 7.73                                          | 6.18                 | 7.50                                               | 25.48                         | 24.72                                       |
| 8787               | 9.03               | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8788               | 8.39               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8416               | 7.03               | 6.79               | 8.24                                          | 6.25                 | 7.59                                               | 27.16                         | 25.00                                       |
| 8417               | 7.06               | 6.71               | 8.15                                          | 6.25                 | 7.59                                               | 26.84                         | 25.00                                       |
| 8418               | 7.24               | 6.91               | 8.39                                          | 6.25                 | 7.59                                               | 27.64                         | 25.00                                       |
| 8419               | 7.57               | 7.21               | 8.75                                          | 6.25                 | 7.59                                               | 28.84                         | 25.00                                       |
| 8420               | 7.18               | 6.74               | 8.18                                          | 6.25                 | 7.59                                               | 26.96                         | 25.00                                       |
| 8421               | 7.91               | 6.73               | 8.17                                          | 6.25                 | 7.59                                               | 26.92                         | 25.00                                       |
| 8789               | 8.24               | 6.78               | 8.23                                          | 6.25                 | 7.59                                               | 27.12                         | 25.00                                       |
| 8790               | 8.23               | 6.76               | 8.21                                          | 6.25                 | 7.59                                               | 27.04                         | 25.00                                       |
| 8791               | 8.58               | 7.06               | 8.57                                          | 6.25                 | 7.59                                               | 28.24                         | 25.00                                       |
| 8792               | 7.85               | 6.58               | 7.99                                          | 6.25                 | 7.59                                               | 26.32                         | 25.00                                       |
| 8431               | 8.57               | 6.47               | 7.85                                          | 6.18                 | 7.50                                               | 25.88                         | 24.72                                       |
| 8432               | 8.89               | 6.73               | 8.17                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8433               | 7.93               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8793               | 7.63               | 6.93               | 8.41                                          | 6.18                 | 7.50                                               | 27.72                         | 24.72                                       |
| 8434               | 7.75               | 7.33               | 8.99                                          | 6.18                 | 7.50                                               | 29.32                         | 24.72                                       |
| 8435               | 7.07               | 6.94               | 8.43                                          | 6.18                 | 7.50                                               | 27.76                         | 24.72                                       |
| 8436               | 6.85               | 6.88               | 8.35                                          | 6.18                 | 7.50                                               | 27.52                         | 24.72                                       |
| 8437               | 6.49               | 7.08               | 8.60                                          | 6.18                 | 7.50                                               | 28.32                         | 24.72                                       |
| 8438               | 10.05              | 5.65               | 6.86                                          | 5.75                 | 6.98                                               | 22.60                         | 23.00                                       |
| 8358               | 8.30               | 6.22               | 7.55                                          | 5.75                 | 6.98                                               | 24.88                         | 23.00                                       |
| 8439               | 8.17               | 6.44               | 7.82                                          | 4.95                 | 6.01                                               | 25.76                         | 19.80                                       |
| 8440               | 8.15               | 6.48               | 7.87                                          | 4.95                 | 6.01                                               | 25.92                         | 19.80                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                                                                 | Where and from Whom Collected.           |
|--------------------|-------------------------------------------------------------------------------------------------|------------------------------------------|
| 8794               | S. G. Cottonseed Meal .....<br>EAGLE COTTON OIL COMPANY,<br>Meridian, Miss.                     | DeSoto Oil Company, Greenville .....     |
| 8441               | H. G. Cottonseed Meal.....                                                                      | H. N. Stuart, Morton.....                |
| 8442               | H. G. Cottonseed Meal.....                                                                      | A. Roberts & Co., Lauderdale.....        |
| 8443               | H. G. Cottonseed Meal.....<br>EASTMAN OIL MILLS,<br>Jonestown, Miss.                            | R. W. Fagan & Co., Waynesboro.....       |
| 8795               | H. G. Cottonseed Meal.....<br>EPES COTTON OIL COMPANY,<br>Epes, Ala.                            | Eastman Oil Mills, Jonestown.....        |
| 8444               | H. G. Cottonseed Meal.....                                                                      | Tom Lyle Grocery Co., Meridian.....      |
| 8445               | H. G. Cottonseed Meal.....<br>A. H. GEORGE & COMPANY,<br>Meridian, Miss.                        | Tom Lyle Grocery Co., Meridian.....      |
| 8446               | H. G. Cottonseed Meal.....                                                                      | A. H. George & Co., Meridian.....        |
| 8447               | H. G. Cottonseed Meal.....                                                                      | A. J. Lyons & Co., Meridian.....         |
| 8796               | H. G. Cottonseed Meal.....                                                                      | R. W. Fagan & Co., Waynesboro.....       |
| 8448               | S. G. Cottonseed Meal .....<br>GLEN ALLEN OIL MILL,<br>Glen Allen, Miss.                        | Meyer Bros., Meridian.....               |
| 8797               | H. G. Cottonseed Meal.....<br>GLOSTER OIL COMPANY,<br>Gloster, Miss.                            | Glen Allen Oil Mill, Glen Allen.....     |
| 8449               | H. G. Cottonseed Meal.....                                                                      | Gloster Oil Company, Gloster.....        |
| 8798               | H. G. Cottonseed Meal.....<br>B. F. GLOVER & SON COM-<br>MISSION CO.,<br>New Orleans, La.       | Gloster Oil Company, Gloster.....        |
| 8799               | H. G. Cottonseed Meal.....                                                                      | W. M. Conty, Scranton.....               |
| 8800               | H. G. Cottonseed Meal.....                                                                      | Herliky & Haas & Co., Kiln.....          |
| 8801               | H. G. Cottonseed Meal.....<br>GRENADA OIL MILL,<br>Grenada, Miss.                               | Herliky & Haas & Co., Bayou Lalla...     |
| 8450               | H. G. Cottonseed Meal.....                                                                      | Miss. Cotton Oil Co., Grenada.....       |
| 8451               | H. G. Cottonseed Meal.....                                                                      | Grenada Oil Mill, Grenada.....           |
| 8452               | H. G. Cottonseed Meal.....                                                                      | F. S. Leavall, Oxford.....               |
| 8453               | H. G. Cottonseed Meal.....                                                                      | Wagner & Company, Water Valley...        |
| 8802               | H. G. Cottonseed Meal.....<br>HAZLEHURST OIL MILL &<br>FERTILIZER COMPANY,<br>Hazlehurst, Miss. | Grenada Oil Mill, Grenada.....           |
| 8454               | H. G. Cottonseed Meal.....                                                                      | Hazlehurst Oil Mill & Fert. Co., H'hurst |
| 8455               | H. G. Cottonseed Meal.....                                                                      | Hazlehurst Oil Mill & Fert. Co., H'hurst |
| 8456               | H. G. Cottonseed Meal.....                                                                      | Simpson Mere. Co., Terry.....            |
| 8457               | H. G. Cottonseed Meal.....                                                                      | Hazlehurst Oil Mill & Fert. Co., H'hurst |
| 8458               | H. G. Cottonseed Meal.....                                                                      | Hazlehurst Oil Mill & Fert. Co., H'hurst |
| 8459               | H. G. Cottonseed Meal.....<br>HOLLYWOOD OIL MILL,<br>Hollywood, Miss.                           | Osyka Supply Co., Osyka.....             |
| 8460               | H. G. Cottonseed Meal.....                                                                      | Hollywood Oil Mill, Hollywood.....       |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8794               | 6.78               | 6.61               | 8.02                                          | 4.95                 | 6.01                                               | \$ 26.44                      | \$ 19.80                                    |
| 8441               | 8.89               | 6.29               | 7.64                                          | 6.18                 | 7.50                                               | 25.16                         | 24.72                                       |
| 8442               | 9.24               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 8443               | 6.96               | 6.51               | 7.90                                          | 6.18                 | 7.50                                               | 26.04                         | 24.72                                       |
| 8795               | 8.24               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8444               | 8.35               | 6.91               | 8.39                                          | 6.18                 | 7.50                                               | 27.64                         | 24.72                                       |
| 8445               | 9.89               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 8446               | 9.93               | 6.37               | 7.73                                          | 6.18                 | 7.50                                               | 25.48                         | 24.72                                       |
| 8447               | 9.57               | 6.33               | 7.68                                          | 6.18                 | 7.50                                               | 25.32                         | 24.72                                       |
| 8796               | 8.33               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 8448               | 9.23               | 6.39               | 7.76                                          | 5.00                 | 6.07                                               | 25.56                         | 20.00                                       |
| 8797               | 7.81               | 5.93               | 7.20                                          | 6.18                 | 7.50                                               | 23.72                         | 24.72                                       |
| 8449               | 7.43               | 7.13               | 8.66                                          | 6.18                 | 7.50                                               | 28.52                         | 24.72                                       |
| 8798               | 8.53               | 6.88               | 8.35                                          | 6.18                 | 7.50                                               | 27.52                         | 24.72                                       |
| 8799               | 9.22               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8800               | 9.13               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8801               | 8.72               | 6.30               | 7.65                                          | 6.18                 | 7.50                                               | 25.20                         | 24.72                                       |
| 8450               | 9.30               | 6.34               | 7.70                                          | 6.18                 | 7.50                                               | 25.36                         | 24.72                                       |
| 8451               | 8.53               | 6.97               | 8.46                                          | 6.18                 | 7.50                                               | 27.88                         | 24.72                                       |
| 8452               | 9.31               | 6.95               | 8.44                                          | 6.18                 | 7.50                                               | 27.80                         | 24.72                                       |
| 8453               | 8.45               | 6.93               | 8.41                                          | 6.18                 | 7.50                                               | 27.72                         | 24.72                                       |
| 8802               | 7.54               | 6.95               | 8.44                                          | 6.18                 | 7.50                                               | 27.80                         | 24.72                                       |
| 8454               | 7.20               | 6.82               | 8.28                                          | 6.18                 | 7.50                                               | 27.28                         | 24.72                                       |
| 8455               | 7.05               | 7.28               | 8.84                                          | 6.18                 | 7.50                                               | 29.12                         | 24.72                                       |
| 8456               | 8.94               | 6.92               | 8.40                                          | 6.18                 | 7.50                                               | 27.68                         | 24.72                                       |
| 8457               | 7.29               | 7.08               | 8.60                                          | 6.18                 | 7.50                                               | 28.32                         | 24.72                                       |
| 8458               | 6.55               | 7.28               | 8.84                                          | 6.18                 | 7.50                                               | 29.12                         | 24.72                                       |
| 8459               | 6.70               | 7.00               | 8.50                                          | 6.18                 | 7.50                                               | 28.00                         | 24.72                                       |
| 8460               | 6.08               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | 26.32                         | 24.72                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                                                           | Where and from Whom Collected.                           |
|--------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------|
|                    | HOUSTON COTTON OIL CO.,<br>Houston, Miss.                                                 |                                                          |
| 8461               | H. G. Cottonseed Meal.....<br>FREDERIC HEAKES & SON,<br>Mobile, Ala.                      | Houston Cotton Oil Co., Houston.....                     |
| 8339               | S. G. Cottonseed Meal.....<br>IMPERIAL COTTON OIL CO.,<br>Macon, Miss.                    | Hood Bros., Gulfport.....                                |
| 8463               | H. G. Cottonseed Meal.....                                                                | L. C. Smith, Lauderdale.....                             |
| 8321               | H. G. Cottonseed Meal.....<br>INDEPENDENT OIL & FERT.<br>WORKS,<br>Columbus, Miss.        | Imperial Cotton Oil Co., Macon.....                      |
| 8464               | H. G. Cottonseed Meal.....                                                                | Independent Oil & Fert. Works, Colu'bus                  |
| 8803               | H. G. Cottonseed Meal.....<br>INDIANOLA COTTON OIL CO.,<br>Indianola, Miss.               | Independent Oil & Fert. Works, Colu'bus                  |
| 8804               | H. G. Cottonseed Meal.....                                                                | Indianola Cotton Oil Co., Indianola....                  |
| 8465               | S. G. Cottonseed Meal.....                                                                | Indianola Cotton Oil Co., Indianola....                  |
| 8466               | S. G. Cottonseed Meal.....                                                                | Indianola Cotton Oil Co., Indianola....                  |
|                    | ITTA BENA COTTON OIL CO.,<br>Itta Bena, Miss.                                             |                                                          |
| 8467               | H. G. Cottonseed Meal.....                                                                | Itta Bena Cotton Oil Co., Itta Bena....                  |
| 8468               | H. G. Cottonseed Meal.....                                                                | Itta Bena Cotton Oil Co., Itta Bena....                  |
| 8469               | H. G. Cottonseed Meal.....                                                                | Hood Bros. Company, Gulfport.....                        |
| 8805               | H. G. Cottonseed Meal.....                                                                | Itta Bena Cotton Oil Co., Itta Bena....                  |
| 7884               | H. G. Cottonseed Meal.....                                                                | Itta Bena Cotton Oil Co., Itta Bena....                  |
|                    | JACKSON COTTON OIL CO.,<br>Jackson, Miss.                                                 |                                                          |
| 8470               | H. G. Cottonseed Meal.....                                                                | Jackson Cotton Oil Co., Jackson.....                     |
| 8471               | H. G. Cottonseed Meal.....                                                                | Jackson Cotton Oil Co., Jackson.....                     |
| 8472               | H. G. Cottonseed Meal.....                                                                | Donald Bros., New Hebron.....                            |
| 8473               | H. G. Cottonseed Meal.....                                                                | W. H. Gallaspy's Sons Co., Hickory....                   |
| 8474               | H. G. Cottonseed Meal.....                                                                | Farmers Union, Neshoba.....                              |
| 8526               | H. G. Cottonseed Meal.....                                                                | C. W. Magee, Braxton.....                                |
| 8806               | H. G. Cottonseed Meal.....<br>JACKSON FERTILIZER CO.,<br>Jackson, Miss.                   | Jackson Cotton Oil Co., Jackson.....                     |
| 8527               | H. G. Cottonseed Meal.....                                                                | Jackson Cotton Oil Co., Agentt.,<br>Crystal Springs..... |
| 8528               | H. G. Cottonseed Meal.....<br>JEFFERSON GIN & OIL MILL,<br>Harriston, Miss.               | Lampton Bros. Company, Tylertown..                       |
| 8529               | H. G. Cottonseed Meal.....<br>KOSCIUSKO OIL MILL &<br>FERTILIZER CO.,<br>Kosciusko, Miss. | Jefferson Gin & Oil Mill, Harriston....                  |
| 8530               | H. G. Cottonseed Meal.....                                                                | W. B. Potts & Sons, Kosciusko.....                       |
| 8531               | H. G. Cottonseed Meal.....                                                                | Jackson-Wallace Co., Kosciusko.....                      |
| 8532               | H. G. Cottonseed Meal.....                                                                | W. B. Potts & Sons, Kosciusko.....                       |
| 8533               | H. G. Cottonseed Meal.....                                                                | J. C. Bennett, Vaiden.....                               |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8461               | 8.29               | 7.00               | 8.50                                          | 6.18                 | 7.50                                               | \$ 28.00                      | \$ 24.72                                    |
| 8339               | 9.08               | 6.03               | 7.32                                          | 4.95                 | 6.01                                               | 24.12                         | 19.80                                       |
| 8463               | 7.26               | 5.94               | 7.21                                          | 6.18                 | 7.50                                               | 23.76                         | 24.72                                       |
| 8321               | 8.93               | 5.69               | 6.91                                          | 6.18                 | 7.50                                               | 22.76                         | 24.72                                       |
| 8464               | 7.91               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | 26.56                         | 24.72                                       |
| 8803               | 8.71               | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8804               | 7.71               | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 8465               | 7.11               | 6.64               | 8.06                                          | 5.77                 | 7.00                                               | 26.56                         | 23.08                                       |
| 8466               | 6.60               | 6.87               | 8.34                                          | 5.77                 | 7.00                                               | 27.48                         | 23.08                                       |
| 8467               | 7.35               | 6.49               | 7.88                                          | 6.18                 | 7.50                                               | 25.96                         | 24.72                                       |
| 8468               | 7.57               | 6.72               | 8.16                                          | 6.18                 | 7.50                                               | 26.88                         | 24.72                                       |
| 8469               | 7.69               | 6.65               | 8.07                                          | 6.18                 | 7.50                                               | 26.60                         | 24.72                                       |
| 8805               | 8.18               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | 26.56                         | 24.72                                       |
| 7884               | 6.82               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8470               | 7.53               | 6.38               | 7.75                                          | 6.18                 | 7.50                                               | 25.52                         | 24.72                                       |
| 8471               | 8.11               | 6.93               | 8.41                                          | 6.18                 | 7.50                                               | 27.72                         | 24.72                                       |
| 8472               | 8.12               | 6.81               | 8.27                                          | 6.18                 | 7.50                                               | 27.24                         | 24.72                                       |
| 8473               | 7.99               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 8474               | 8.60               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 8526               | 8.74               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 8806               | 6.97               | 6.97               | 8.46                                          | 6.18                 | 7.50                                               | 27.88                         | 24.72                                       |
| 8527               | 7.78               | 7.07               | 8.58                                          | 6.18                 | 7.50                                               | 28.28                         | 24.72                                       |
| 8528               | 7.83               | 6.86               | 8.33                                          | 6.18                 | 7.50                                               | 27.44                         | 24.72                                       |
| 8529               | 7.68               | 6.68               | 8.11                                          | 6.58                 | 7.99                                               | 26.72                         | 26.32                                       |
| 8530               | 7.25               | 6.54               | 7.94                                          | 6.18                 | 7.50                                               | 26.16                         | 24.72                                       |
| 8531               | 8.60               | 6.79               | 8.24                                          | 6.18                 | 7.50                                               | 27.16                         | 24.72                                       |
| 8532               | 7.85               | 6.33               | 7.68                                          | 6.18                 | 7.50                                               | 25.32                         | 24.72                                       |
| 8533               | 8.72               | 6.84               | 8.30                                          | 6.18                 | 7.50                                               | 27.36                         | 24.72                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                                                         | Where and from Whom Collected.                        |
|--------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------|
| 8807               | H. G. Cottonseed Meal.....<br>LAUREL OIL & FERT. CO.,<br>Laurel, Miss.                  | Jackson-Wallace Co., Kosciusko.....                   |
| 8534               | H. G. Cottonseed Meal.....                                                              | Laurel Oil & Fert. Co., Laurel.....                   |
| 8535               | H. G. Cottonseed Meal.....                                                              | Hicks Merc. Co., Laurel.....                          |
| 8536               | H. G. Cottonseed Meal.....                                                              | J. E. McNair, Lumberton.....                          |
| 8537               | H. G. Cottonseed Meal.....                                                              | W. W. Pigford, Lumberton.....                         |
| 8538               | H. G. Cottonseed Meal.....                                                              | J. R. Caldwell, Ellisville.....                       |
| 8539               | H. G. Cottonseed Meal.....                                                              | Hicks Merc. Co., Laurel.....                          |
| 8540               | H. G. Cottonseed Meal.....                                                              | Champion Lumber Co., Orvisburg.....                   |
| 8541               | H. G. Cottonseed Meal.....                                                              | Cox Merc. Co., Braxton.....                           |
| 8542               | H. G. Cottonseed Meal.....                                                              | Morgan Smiley Co., Heidelberg.....                    |
| 8808               | H. G. Cottonseed Meal.....                                                              | E. B. Perry, Taylorsville.....                        |
| 8809               | H. G. Cottonseed Meal.....                                                              | D. C. Griffith Co., Silver Creek.....                 |
| 8810               | H. G. Cottonseed Meal.....                                                              | R. F. Walden & Co., Prentiss.....                     |
| 8811               | H. G. Cottonseed Meal.....                                                              | Cash Feed Store, Richton.....                         |
| 8812               | H. G. Cottonseed Meal.....                                                              | H. M. Wildy, McLean.....                              |
| 8813               | H. G. Cottonseed Meal.....                                                              | W. W. Pigford, Lumberton.....                         |
| 8814               | H. G. Cottonseed Meal.....                                                              | The T. B. Bonner Co., Laurel.....                     |
| 8815               | H. G. Cottonseed Meal.....<br>LELAND OIL WORKS,<br>Leland, Miss.                        | J. E. Bounds, Vossburg.....                           |
| 8543               | H. G. Cottonseed Meal.....                                                              | Leland Oil Works, Leland.....                         |
| 8544               | H. G. Cottonseed Meal.....                                                              | Leland Oil Works, Leland.....                         |
| 8816               | H. G. Cottonseed Meal.....<br>LEXINGTON COMPRESS & OIL<br>MILL Co.,<br>Lexington, Miss. | Leland Oil Works, Leland.....                         |
| 8545               | H. G. Cottonseed Meal.....                                                              | Lexington Compress & Oil Mill Co.,<br>Lexington ..... |
| 8546               | H. G. Cottonseed Meal.....<br>MAGNOLIA OIL MILL & M'F'G.<br>COMPANY,<br>Magnolia, Miss. | Lexington Compress & Oil Mill Co.,<br>Lexington ..... |
| 8547               | H. G. Cottonseed Meal.....                                                              | Magnolia Oil Mill & Mfg. Co., Magnolia                |
| 8548               | H. G. Cottonseed Meal.....<br>MERIDIAN FERT. FACTORY,<br>Meridian, Miss.                | Magnolia Oil Mill & Mfg. Co., Magnolia                |
| 8549               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Montrose Merc. Co., Montrose.....                     |
| 8556               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Meridian Fertilizer Factory, Meridian                 |
| 8557               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Mrs. R. J. Briggs, State Line.....                    |
| 8558               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Hawkins, McRaney Co., Bassfield.....                  |
| 8559               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Holloway & McRaney, Collins.....                      |
| 8817               | H. G. Golden Rod Choice<br>Cottonseed Meal .....                                        | Croom & Story, Lucedale.....                          |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8807               | 8.04               | 6.27               | 7.61                                          | 6.18                 | 7.50                                               | \$ 25.08                      | \$ 24.72                                    |
| 8534               | 7.47               | 6.44               | 7.82                                          | 6.18                 | 7.50                                               | 25.76                         | 24.72                                       |
| 8535               | 8.48               | 6.43               | 7.81                                          | 6.18                 | 7.50                                               | 25.72                         | 24.72                                       |
| 8536               | 8.07               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8537               | 7.69               | 6.33               | 7.68                                          | 6.18                 | 7.50                                               | 25.32                         | 24.72                                       |
| 8538               | 8.42               | 6.35               | 7.71                                          | 6.18                 | 7.50                                               | 25.40                         | 24.72                                       |
| 8539               | 7.75               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                       |
| 8540               | 7.81               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |
| 8541               | 8.35               | 6.24               | 7.58                                          | 6.18                 | 7.50                                               | 24.96                         | 24.72                                       |
| 8542               | 9.36               | 6.17               | 7.49                                          | 6.18                 | 7.50                                               | 24.68                         | 24.72                                       |
| 8808               | 9.05               | 6.27               | 7.61                                          | 6.18                 | 7.50                                               | 25.08                         | 24.72                                       |
| 8809               | 7.82               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8810               | 8.45               | 6.19               | 7.51                                          | 6.18                 | 7.50                                               | 24.76                         | 24.72                                       |
| 8811               | 9.35               | 6.06               | 7.36                                          | 6.18                 | 7.50                                               | 24.24                         | 24.72                                       |
| 8812               | 8.73               | 6.20               | 7.53                                          | 6.18                 | 7.50                                               | 24.80                         | 24.72                                       |
| 8813               | 8.86               | 6.45               | 7.83                                          | 6.18                 | 7.50                                               | 25.80                         | 24.72                                       |
| 8814               | 7.37               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8815               | 6.78               | 6.47               | 7.85                                          | 6.18                 | 7.50                                               | 25.88                         | 24.72                                       |
| 8543               | 8.04               | 6.49               | 7.88                                          | 6.18                 | 7.50                                               | 25.96                         | 24.72                                       |
| 8544               | 9.19               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 8816               | 7.41               | 6.40               | 7.77                                          | 6.18                 | 7.50                                               | 25.60                         | 24.72                                       |
| 8545               | 9.73               | 6.10               | 7.41                                          | 6.18                 | 7.50                                               | 24.40                         | 24.72                                       |
| 8546               | 10.34              | 6.29               | 7.61                                          | 6.18                 | 7.50                                               | 25.16                         | 24.72                                       |
| 8547               | 7.97               | 7.00               | 8.50                                          | 6.18                 | 7.50                                               | 28.00                         | 24.72                                       |
| 8548               | 7.44               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 8549               | 9.24               | 6.98               | 8.47                                          | 6.59                 | 8.00                                               | 27.92                         | 26.36                                       |
| 8556               | 8.27               | 7.07               | 8.58                                          | 6.59                 | 8.00                                               | 28.28                         | 26.36                                       |
| 8557               | 8.11               | 6.91               | 8.39                                          | 6.59                 | 8.00                                               | 27.64                         | 26.36                                       |
| 8558               | 7.20               | 7.17               | 8.70                                          | 6.59                 | 8.00                                               | 28.68                         | 26.36                                       |
| 8559               | 8.37               | 6.84               | 8.30                                          | 6.59                 | 8.00                                               | 27.36                         | 26.36                                       |
| 8817               | 7.49               | 6.60               | 8.01                                          | 6.59                 | 8.00                                               | 26.40                         | 26.36                                       |



| Laboratory Number. | Name of Brand and Manufacturer.               | Where and from Whom Collected.            |
|--------------------|-----------------------------------------------|-------------------------------------------|
| 8818               | H. G. Golden Rod Choice Cottonseed Meal       | Holloway & Worthy, Carson                 |
| 8820               | H. G. Golden Rod Choice Cottonseed Meal       | Lucedale Commercial Co., Lucedale         |
| 8823               | H. G. Golden Rod Choice Cottonseed Meal       | L. N. Nobles, State Line                  |
| 8824               | H. G. Golden Rod Choice Cottonseed Meal       | Mrs. R. J. Briggs, State Line             |
| 8550               | H. G. Cottonseed Meal                         | H. N. Stuart, Morton                      |
| 8551               | H. G. Cottonseed Meal                         | T. B. Gaddis, Morton                      |
| 8552               | H. G. Cottonseed Meal                         | Storey & Company, Forest                  |
| 8553               | H. G. Cottonseed Meal                         | Smythe, Gaddis & Co., Forest              |
| 8554               | H. G. Cottonseed Meal                         | T. B. Gaddis, Morton                      |
| 8555               | H. G. Cottonseed Meal                         | J. H. Williams & Sons, Prentiss           |
| 8819               | H. G. Cottonseed Meal                         | A. E. Dalrymple Sons Co., Amory           |
| 8821               | H. G. Cottonseed Meal                         | J. K. Kirkland, Quitman                   |
| 8822               | H. G. Cottonseed Meal                         | J. M. Carter, Quitman                     |
| 8825               | H. G. Cottonseed Meal                         | Miss. & Ala. Co-Operative Co., State Line |
| 8826               | H. G. Cottonseed Meal                         | W. Rosenbaum, DeKalb                      |
|                    | MINTER CITY OIL WORKS,<br>Minter City, Miss.  |                                           |
| 8616               | H. G. Cottonseed Meal                         | Minter City Oil Works, Minter City        |
| 8617               | H. G. Cottonseed Meal                         | A. E. Jennings Co., Water Valley          |
| 8618               | H. G. Cottonseed Meal                         | Taylor Bros., Eupora                      |
| 8827               | H. G. Cottonseed Meal                         | Minter City Oil Works, Minter City        |
|                    | MISSISSIPPI COTTON OIL CO.,<br>Jackson, Miss. |                                           |
| 8561               | H. G. Cottonseed Meal                         | Mississippi Cotton Oil Co., Yazoo City    |
| 8562               | H. G. Cottonseed Meal                         | G. W. Lewis, Kosciusko                    |
| 8563               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Clarksdale          |
| 8564               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., West Point          |
| 8565               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Columbus            |
| 8566               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Jackson             |
| 8567               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Greenville          |
| 8568               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Natchez             |
| 8569               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Natchez             |
| 8570               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Clarksdale          |
| 8571               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Jackson             |
| 8572               | H. G. Cottonseed Meal                         | R. L. Simmons, Newton                     |
| 8573               | H. G. Cottonseed Meal                         | W. H. Gallaspy's Sons Co., Hickory        |
| 8574               | H. G. Cottonseed Meal                         | W. C. Ellis Merc. Co., Magee              |
| 8575               | H. G. Cottonseed Meal                         | W. B. Armstrong, Vaiden                   |
| 8602               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Grenada             |
| 8603               | H. G. Cottonseed Meal                         | J. W. Grantham & Co., Terry               |
| 8604               | H. G. Cottonseed Meal                         | S. E. Dudley & Co., Hermanville           |
| 8605               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Grenada             |
| 8606               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., Jackson             |
| 8607               | H. G. Cottonseed Meal                         | Miss. Cotton Oil Co., West Point          |
| 8608               | H. G. Cottonseed Meal                         | J. K. Kirkland, Quitman                   |
| 8609               | H. G. Cottonseed Meal                         | Miss. & Ala. Co-Op. Co., State Line       |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8818               | 8.07               | 6.64               | 8.06                                          | 6.59                 | 8.00                                               | \$ 26.56                      | \$ 26.36                                    |
| 8820               | 7.86               | 6.45               | 7.83                                          | 6.59                 | 8.00                                               | 25.80                         | 26.36                                       |
| 8823               | 6.48               | 6.82               | 8.28                                          | 6.59                 | 8.00                                               | 27.28                         | 26.36                                       |
| 8824               | 7.53               | 6.88               | 8.35                                          | 6.59                 | 8.00                                               | 27.52                         | 26.36                                       |
| 8550               | 8.36               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                       |
| 8551               | 8.15               | 6.65               | 8.07                                          | 6.18                 | 7.50                                               | 26.60                         | 24.72                                       |
| 8552               | 8.98               | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | 26.80                         | 24.72                                       |
| 8553               | 8.89               | 6.75               | 8.19                                          | 6.18                 | 7.50                                               | 27.00                         | 24.72                                       |
| 8554               | 8.61               | 6.31               | 7.66                                          | 6.18                 | 7.50                                               | 25.24                         | 24.72                                       |
| 8555               | 7.85               | 6.66               | 8.09                                          | 6.18                 | 7.50                                               | 26.64                         | 24.72                                       |
| 8819               | 19.38              | 6.71               | 8.15                                          | 6.18                 | 7.50                                               | 26.84                         | 24.72                                       |
| 8821               | 10.69              | 6.67               | 8.10                                          | 6.18                 | 7.50                                               | 26.68                         | 24.72                                       |
| 8822               | 10.24              | 6.29               | 7.64                                          | 6.18                 | 7.50                                               | 25.16                         | 24.72                                       |
| 8825               | 10.42              | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8826               | 8.52               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8616               | 9.71               | 6.90               | 8.38                                          | 6.18                 | 7.50                                               | 27.60                         | 24.72                                       |
| 8617               | 9.14               | 6.86               | 8.33                                          | 6.18                 | 7.50                                               | 27.44                         | 24.72                                       |
| 8618               | 9.05               | 6.88               | 8.35                                          | 6.18                 | 7.50                                               | 27.52                         | 24.72                                       |
| 8827               | 7.50               | 7.13               | 8.66                                          | 6.18                 | 7.50                                               | 28.52                         | 24.72                                       |
| 8561               | 9.12               | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8562               | 8.94               | 6.30               | 7.65                                          | 6.18                 | 7.50                                               | 25.20                         | 24.72                                       |
| 8563               | 7.88               | 6.60               | 8.01                                          | 6.18                 | 7.50                                               | 26.40                         | 24.72                                       |
| 8564               | 9.24               | 6.44               | 7.82                                          | 6.18                 | 7.50                                               | 25.76                         | 24.72                                       |
| 8565               | 10.16              | 6.37               | 7.73                                          | 6.18                 | 7.50                                               | 25.48                         | 24.72                                       |
| 8566               | 8.79               | 6.34               | 7.70                                          | 6.18                 | 7.50                                               | 25.36                         | 24.72                                       |
| 8567               | 8.86               | 8.22               | 7.55                                          | 6.18                 | 7.50                                               | 24.88                         | 24.72                                       |
| 8568               | 9.58               | 6.42               | 7.79                                          | 6.18                 | 7.50                                               | 25.68                         | 24.72                                       |
| 8569               | 9.17               | 6.28               | 7.62                                          | 6.18                 | 7.50                                               | 25.12                         | 24.72                                       |
| 8570               | 8.98               | 6.22               | 7.55                                          | 6.18                 | 7.50                                               | 24.88                         | 24.72                                       |
| 8571               | 9.33               | 6.28               | 7.62                                          | 6.18                 | 7.50                                               | 25.12                         | 24.72                                       |
| 8572               | 9.60               | 6.40               | 7.77                                          | 6.18                 | 7.50                                               | 25.60                         | 24.72                                       |
| 8573               | 9.75               | 5.92               | 7.19                                          | 6.18                 | 7.50                                               | 23.68                         | 24.72                                       |
| 8574               | 10.07              | 6.26               | 7.60                                          | 6.18                 | 7.50                                               | 25.04                         | 24.72                                       |
| 8575               | 9.89               | 6.39               | 7.76                                          | 6.18                 | 7.50                                               | 25.56                         | 24.72                                       |
| 8602               | 10.08              | 6.35               | 7.71                                          | 6.18                 | 7.50                                               | 25.40                         | 24.72                                       |
| 8603               | 12.96              | 6.18               | 7.50                                          | 6.18                 | 7.50                                               | 24.72                         | 24.72                                       |
| 8604               | 9.79               | 6.25               | 7.59                                          | 6.18                 | 7.50                                               | 25.00                         | 24.72                                       |
| 8605               | 9.80               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8606               | 8.99               | 6.33               | 7.68                                          | 6.18                 | 7.50                                               | 25.32                         | 24.72                                       |
| 8607               | 9.20               | 6.72               | 8.16                                          | 6.18                 | 7.50                                               | 26.88                         | 24.72                                       |
| 8608               | 9.79               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |
| 8609               | 9.38               | 6.52               | 7.92                                          | 6.18                 | 7.50                                               | 26.08                         | 24.72                                       |

| Laboratory Number. | Name of Brand and Manufacturer.               | Where and from Whom Collected.          |
|--------------------|-----------------------------------------------|-----------------------------------------|
| 8610               | H. G. Cottonseed Meal.....                    | Johnson-Hand Co., Ellisville.....       |
| 8611               | H. G. Cottonseed Meal.....                    | Merchants Grocery Co., Hattiesburg....  |
| 8612               | H. G. Cottonseed Meal.....                    | J. A. McLeod Co., Hattiesburg.....      |
| 8613               | H. G. Cottonseed Meal.....                    | Lampton & Rawls Co., Mt. Olive.....     |
| 8614               | H. G. Cottonseed Meal.....                    | Johnson-Hand Co., Ellisville.....       |
| 8615               | H. G. Cottonseed Meal.....                    | J. P. Meyer, Ellisville.....            |
| 8828               | H. G. Cottonseed Meal.....                    | J. P. Cox Merc. Co., Braxton.....       |
| 8829               | H. G. Cottonseed Meal.....                    | D'Lo Merc. Co., D'Lo.....               |
| 8830               | H. G. Cottonseed Meal.....                    | U. G. McInnis, Pinola.....              |
| 8831               | H. G. Cottonseed Meal.....                    | W. E. Floyd & Co., Mendenhall.....      |
| 8832               | H. G. Cottonseed Meal.....                    | Lampton & Rawls Co., Mt. Olive.....     |
| 8833               | H. G. Cottonseed Meal.....                    | M. Gerson, Collins.....                 |
| 8834               | H. G. Cottonseed Meal.....                    | Stuart & Hemiter, Gandsi.....           |
| 8835               | H. G. Cottonseed Meal.....                    | Biloxi Roller Mills, Biloxi.....        |
| 8836               | H. G. Cottonseed Meal.....                    | The Batson-Bond Co., Bond.....          |
| 8837               | H. G. Cottonseed Meal.....                    | Jeff. Griffis Merc. Co., Beaumont.....  |
| 8838               | H. G. Cottonseed Meal.....                    | John A. McLeod Co., Hattiesburg.....    |
| 8839               | H. G. Cottonseed Meal.....                    | McLeod & Co., Purvis.....               |
| 8840               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., West Point.....   |
| 8841               | H. G. Cottonseed Meal.....                    | Tom Lyle Grocery Co., Meridian.....     |
| 8842               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Meridian.....     |
| 8843               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Jackson.....      |
| 8844               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Natchez.....      |
| 8845               | H. G. Cottonseed Meal.....                    | Bailey Bros., Coffeeville.....          |
| 8846               | H. G. Cottonseed Meal.....                    | Centreville Merc. Co., Centreville..... |
| 8847               | H. G. Cottonseed Meal.....                    | Kennedy & Co., New Augusta.....         |
| 8848               | H. G. Cottonseed Meal.....                    | McLean Merc. Co., McLean.....           |
| 8849               | H. G. Cottonseed Meal.....                    | W. M. Hyde & Co., Poplarville.....      |
| 8850               | H. G. Cottonseed Meal.....                    | Cohn Bros., Lorman.....                 |
| 8851               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Natchez.....      |
| 8852               | H. G. Cottonseed Meal.....                    | J. B. Mitchell, Ackerman.....           |
| 8853               | H. G. Cottonseed Meal.....                    | Lampton & Rawls Co., Mt. Olive.....     |
| 8854               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Greenville.....   |
| 8855               | H. G. Cottonseed Meal.....                    | J. P. Meyer, Ellisville.....            |
| 8856               | H. G. Cottonseed Meal.....                    | Tom Lyle Grocery Co., Meridian.....     |
| 8857               | H. G. Cottonseed Meal.....                    | Miss. Cotton Oil Co., Yazoo City.....   |
| 8193               | H. G. Cottonseed Meal.....                    | Mississippi Cotton Oil Co., Jackson.... |
| 8359               | H. G. Cottonseed Meal.....                    | Experiment Station, Stoneville.....     |
|                    | MOORHEAD OIL COMPANY,<br>Moorhead, Miss.      |                                         |
| 8619               | S. G. Cottonseed Meal.....                    | Moorhead Oil Co., Moorhead.....         |
| 8858               | H. G. Cottonseed Meal.....                    | Moorhead Oil Co., Moorhead.....         |
|                    | NATCHEZ OIL COMPANY,<br>Natchez, Miss.        |                                         |
| 8620               | H. G. Cottonseed Meal.....                    | Natchez Oil Co., Natchez.....           |
| 8621               | H. G. Cottonseed Meal.....                    | Natchez Oil Co., Natchez.....           |
| 8859               | H. G. Cottonseed Meal.....                    | Natchez Oil Co., Natchez.....           |
| 8860               | H. G. Cottonseed Meal.....                    | Natchez Oil Co., Natchez.....           |
|                    | NEW ALBANY OIL MILL CO.,<br>New Albany, Miss. |                                         |
| 8622               | H. G. Cottonseed Meal.....                    | New Albany Oil Mill Co., New Albany     |



| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen<br>Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|-------------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8610               | 8.72               | 6.19               | 7.51                                          | 6.18                    | 7.50                                               | \$ 24.76                      | \$ 24.72                                    |
| 8611               | 9.30               | 6.44               | 7.82                                          | 6.18                    | 7.50                                               | 25.76                         | 24.72                                       |
| 8612               | 10.25              | 6.13               | 7.43                                          | 6.18                    | 7.50                                               | 24.52                         | 24.72                                       |
| 8613               | 9.16               | 6.31               | 7.66                                          | 6.18                    | 7.50                                               | 25.24                         | 24.72                                       |
| 8614               | 9.06               | 6.04               | 7.33                                          | 6.18                    | 7.50                                               | 24.16                         | 24.72                                       |
| 8615               | 9.74               | 6.10               | 7.41                                          | 6.18                    | 7.50                                               | 24.40                         | 24.72                                       |
| 8828               | 9.38               | 6.08               | 7.38                                          | 6.18                    | 7.50                                               | 24.32                         | 24.72                                       |
| 8829               | 9.20               | 6.12               | 7.43                                          | 6.18                    | 7.50                                               | 24.48                         | 24.72                                       |
| 8830               | 7.80               | 6.36               | 7.72                                          | 6.18                    | 7.50                                               | 25.44                         | 24.72                                       |
| 8831               | 7.91               | 6.10               | 7.41                                          | 6.18                    | 7.50                                               | 24.40                         | 24.72                                       |
| 8832               | 7.94               | 5.97               | 7.25                                          | 6.18                    | 7.50                                               | 23.88                         | 24.72                                       |
| 8833               | 8.95               | 6.04               | 7.33                                          | 6.18                    | 7.50                                               | 24.16                         | 24.72                                       |
| 8834               | 8.36               | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.42                         | 24.72                                       |
| 8835               | 9.12               | 6.13               | 7.44                                          | 6.18                    | 7.50                                               | 24.52                         | 24.72                                       |
| 8836               | 8.57               | 6.22               | 7.55                                          | 6.18                    | 7.50                                               | 24.88                         | 24.72                                       |
| 8837               | 8.53               | 6.37               | 7.73                                          | 6.18                    | 7.50                                               | 25.48                         | 24.72                                       |
| 8838               | 8.64               | 6.12               | 7.43                                          | 6.18                    | 7.50                                               | 24.48                         | 24.72                                       |
| 8839               | 8.31               | 6.44               | 7.82                                          | 6.18                    | 7.50                                               | 25.76                         | 24.72                                       |
| 8840               | 8.75               | 6.49               | 7.88                                          | 6.18                    | 7.50                                               | 25.96                         | 24.72                                       |
| 8841               | 8.91               | 6.46               | 7.84                                          | 6.18                    | 7.50                                               | 25.84                         | 24.72                                       |
| 8842               | 8.32               | 6.46               | 7.84                                          | 6.18                    | 7.50                                               | 25.84                         | 24.72                                       |
| 8843               | 8.06               | 6.49               | 7.88                                          | 6.18                    | 7.50                                               | 25.96                         | 24.72                                       |
| 8844               | 7.63               | 6.18               | 7.50                                          | 6.18                    | 7.50                                               | 24.72                         | 24.72                                       |
| 8845               | 9.44               | 6.59               | 8.00                                          | 6.18                    | 7.50                                               | 26.36                         | 24.72                                       |
| 8846               | 8.50               | 6.20               | 7.53                                          | 6.18                    | 7.50                                               | 24.80                         | 24.72                                       |
| 8847               | 8.98               | 6.18               | 7.50                                          | 6.18                    | 7.50                                               | 24.72                         | 24.72                                       |
| 8848               | 8.50               | 6.30               | 7.65                                          | 6.18                    | 7.50                                               | 25.20                         | 24.72                                       |
| 8849               | 6.94               | 6.32               | 7.67                                          | 6.18                    | 7.50                                               | 25.28                         | 24.72                                       |
| 8850               | 8.80               | 6.32               | 7.67                                          | 6.18                    | 7.50                                               | 25.28                         | 24.72                                       |
| 8851               | 7.64               | 6.09               | 7.39                                          | 6.18                    | 7.50                                               | 24.36                         | 24.72                                       |
| 8852               | 7.46               | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 8853               | 7.67               | 6.39               | 7.76                                          | 6.18                    | 7.50                                               | 25.56                         | 24.72                                       |
| 8854               | 6.36               | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 8855               | 8.80               | 5.87               | 7.13                                          | 6.18                    | 7.50                                               | 23.48                         | 24.72                                       |
| 8856               | 6.84               | 6.25               | 7.59                                          | 6.18                    | 7.50                                               | 25.00                         | 24.72                                       |
| 8857               | 5.05               | 6.21               | 7.54                                          | 6.18                    | 7.50                                               | 24.84                         | 24.72                                       |
| 8193               | 9.75               | 6.18               | 7.50                                          | 6.18                    | 7.50                                               | 24.72                         | 24.72                                       |
| 8359               | 7.79               | 6.67               | 8.10                                          | 6.18                    | 7.50                                               | 26.68                         | 24.72                                       |
|                    |                    |                    |                                               |                         |                                                    |                               |                                             |
| 8619               | 8.08               | 6.48               | 7.87                                          | 4.95                    | 6.01                                               | 25.92                         | 19.80                                       |
| 8858               | 7.66               | 5.97               | 7.25                                          | 6.18                    | 7.50                                               | 23.88                         | 24.72                                       |
|                    |                    |                    |                                               |                         |                                                    |                               |                                             |
| 8620               | 7.96               | 6.49               | 7.88                                          | 6.18                    | 7.50                                               | 25.96                         | 24.72                                       |
| 8621               | 8.38               | 6.33               | 7.68                                          | 6.18                    | 7.50                                               | 25.32                         | 24.72                                       |
| 8859               | 5.73               | 6.65               | 8.07                                          | 6.18                    | 7.50                                               | 26.60                         | 24.72                                       |
| 8860               | 5.87               | 6.50               | 7.89                                          | 6.18                    | 7.50                                               | 26.00                         | 24.72                                       |
|                    |                    |                    |                                               |                         |                                                    |                               |                                             |
| 8622               | 7.74               | 6.97               | 8.46                                          | 6.18                    | 7.50                                               | 27.88                         | 24.72                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                                                                 | Where and from Whom Collected.                           |
|--------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| 8623               | H. G. Cottonseed Meal.....<br>NEWTON OIL & M'F'G. Co.,<br>Newton, Miss.                         | New Albany Oil Mill Co., New Albany                      |
| 8624               | H. G. Cottonseed Meal.....                                                                      | A. Boutwell, Ellisville.....                             |
| 8625               | H. G. Cottonseed Meal.....                                                                      | Lyndon Lumber Co., Wingate.....                          |
| 8626               | H. G. Cottonseed Meal.....                                                                      | Ovett Merc. Co., Ovett.....                              |
| 8627               | H. G. Cottonseed Meal.....                                                                      | J. W. Johnson, Noxapater.....                            |
| 8628               | H. G. Cottonseed Meal.....                                                                      | J. B. Stewart, Philadelphia.....                         |
| 8629               | H. G. Cottonseed Meal.....                                                                      | J. T. Hunter, Decatur.....                               |
| 8630               | H. G. Cottonseed Meal.....                                                                      | C. W. Alexander, Montrose.....                           |
| 8631               | H. G. Cottonseed Meal.....                                                                      | M. A. Metts, Louisville.....                             |
| 8861               | H. G. Cottonseed Meal.....                                                                      | Stevens & Ruffin, Richton.....                           |
| 8862               | H. G. Cottonseed Meal.....                                                                      | Beaman & Co., Forest.....                                |
| 8863               | H. G. Cottonseed Meal.....<br>NORTH MISS. OIL MILLS,<br>Holly Springs, Miss.                    | Riverside Commercial Co., Leaf.....                      |
| 8632               | H. G. Cottonseed Meal.....                                                                      | North Miss. Oil Mills, Holly Springs...                  |
| 8633               | H. G. Cottonseed Meal.....<br>OKOLONA COTTON OIL Co.,<br>Okolona, Miss.                         | North Miss. Oil Mills, Holly Springs...                  |
| 8634               | H. G. Cottonseed Meal.....                                                                      | Okolona Cotton Oil Co., Okolona.....                     |
| 8635               | H. G. Cottonseed Meal.....                                                                      | Corinth Cotton Oil Co., Booneville....                   |
| 8864               | H. G. Cottonseed Meal.....<br>OKOLONA COTTON OIL Co.,<br>Oxford, Miss.                          | Okolona Cotton Oil Co., Okolona.....                     |
| 8636               | H. G. Cottonseed Meal.....                                                                      | Oxford Cotton Oil Co., Oxford.....                       |
| 8637               | H. G. Cottonseed Meal.....                                                                      | Oxford Cotton Oil Co., Oxford.....                       |
| 8638               | H. G. Cottonseed Meal.....<br>PEOPLES COTTON OIL & FIBER<br>COMPANY,<br>North Carrollton, Miss. | Oxford Cotton Oil Co., Oxford.....                       |
| 8639               | S. G. Cottonseed Meal.....                                                                      | Peoples Cotton Oil & Fiber Co.,<br>North Carrollton..... |
| 8640               | S. G. Cottonseed Meal.....                                                                      | T. B. Bonner Co., Laurel.....                            |
| 8641               | S. G. Cottonseed Meal.....                                                                      | Peoples Cotton Oil & Fiber Co.,<br>North Carrollton..... |
| 8642               | S. G. Cottonseed Meal.....                                                                      | Peoples Cotton Oil & Fiber Co.,<br>North Carrollton..... |
| 8643               | S. G. Cottonseed Meal.....                                                                      | T. H. Deas, Enterprise.....                              |
| 8644               | S. G. Cottonseed Meal.....                                                                      | C. T. Bonney, Enterprise.....                            |
| 8645               | S. G. Cottonseed Meal.....                                                                      | Farmers Union Warehouse Co.,<br>Ellisville.....          |
| 8865               | S. G. Cottonseed Meal.....                                                                      | Hood Bros., Gulfport.....                                |
| 8866               | S. G. Cottonseed Meal.....                                                                      | Peoples Cotton Oil & Fiber Co.,<br>North Carrollton..... |
| 8867               | S. G. Cottonseed Meal.....<br>PEOPLES OIL MILL & FERT.<br>WORKS,<br>Aberdeen, Miss.             | Hood Milling Co., Gulfport.....                          |
| 8646               | H. G. Cottonseed Meal.....                                                                      | Peoples Oil Mill & Fert. Works,<br>Aberdeen.....         |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Ammonia—<br>equivalent of Nitrogen<br>—Found. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|-----------------------------------------------|
| 8623               | 7.24               | 6.74               | 8.18                                          | 6.18                 | 7.50                                               | \$ 26.96                      | \$ 24.72                                      |
| 8624               | 10.28              | 5.88               | 7.14                                          | 6.18                 | 7.50                                               | 23.52                         | 24.72                                         |
| 8625               | 9.20               | 6.22               | 7.55                                          | 6.18                 | 7.50                                               | 24.88                         | 24.72                                         |
| 8626               | 9.33               | 6.33               | 7.68                                          | 6.18                 | 7.50                                               | 25.32                         | 24.72                                         |
| 8627               | 8.59               | 6.56               | 7.96                                          | 6.18                 | 7.50                                               | 26.24                         | 24.72                                         |
| 8628               | 9.03               | 6.65               | 8.07                                          | 6.18                 | 7.50                                               | 26.60                         | 24.72                                         |
| 8629               | 8.87               | 6.83               | 8.29                                          | 6.18                 | 7.50                                               | 27.32                         | 24.72                                         |
| 8630               | 8.87               | 6.08               | 7.38                                          | 6.18                 | 7.50                                               | 24.32                         | 24.72                                         |
| 8631               | 9.18               | 6.59               | 8.00                                          | 6.18                 | 7.50                                               | 26.36                         | 24.72                                         |
| 8861               | 7.64               | 6.32               | 7.67                                          | 6.18                 | 7.50                                               | 25.28                         | 24.72                                         |
| 8862               | 8.08               | 6.07               | 7.37                                          | 6.18                 | 7.50                                               | 24.28                         | 24.72                                         |
| 8863               | 7.59               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                         |
| 8632               | 6.69               | 6.88               | 8.35                                          | 6.18                 | 7.50                                               | 27.52                         | 24.72                                         |
| 8633               | 7.75               | 7.06               | 8.57                                          | 6.18                 | 7.50                                               | 28.24                         | 24.72                                         |
| 8634               | 7.76               | 7.10               | 8.62                                          | 6.40                 | 7.77                                               | 28.40                         | 25.60                                         |
| 8635               | 7.76               | 7.18               | 8.72                                          | 6.40                 | 7.77                                               | 28.72                         | 25.60                                         |
| 8864               | 9.43               | 7.04               | 8.55                                          | 6.40                 | 7.77                                               | 28.16                         | 25.60                                         |
| 8636               | 8.28               | 6.87               | 8.34                                          | 6.18                 | 7.50                                               | 27.48                         | 24.72                                         |
| 8637               | 9.26               | 6.38               | 7.75                                          | 6.18                 | 7.50                                               | 25.52                         | 24.72                                         |
| 8638               | 7.80               | 6.54               | 7.94                                          | 6.18                 | 7.30                                               | 26.16                         | 24.72                                         |
| 8639               | 8.78               | 6.19               | 7.51                                          | 5.40                 | 6.56                                               | 24.76                         | 21.60                                         |
| 8640               | 8.63               | 6.28               | 7.62                                          | 5.40                 | 6.56                                               | 25.12                         | 21.60                                         |
| 8641               | 8.76               | 6.32               | 7.67                                          | 5.40                 | 6.56                                               | 25.28                         | 21.60                                         |
| 8642               | 9.02               | 6.43               | 7.81                                          | 5.40                 | 6.56                                               | 25.72                         | 21.60                                         |
| 8643               | 9.22               | 6.17               | 7.49                                          | 5.40                 | 6.56                                               | 24.86                         | 21.60                                         |
| 8644               | 8.89               | 6.30               | 7.65                                          | 5.40                 | 6.56                                               | 25.20                         | 21.60                                         |
| 8645               | 9.00               | 6.21               | 7.54                                          | 5.40                 | 6.56                                               | 24.84                         | 21.60                                         |
| 8865               | 8.48               | 6.07               | 7.37                                          | 5.40                 | 6.56                                               | 24.28                         | 21.60                                         |
| 8866               | 8.05               | 6.37               | 7.73                                          | 5.40                 | 6.56                                               | 25.48                         | 21.60                                         |
| 8867               | 8.29               | 6.23               | 7.56                                          | 5.40                 | 6.56                                               | 24.92                         | 21.60                                         |
| 8646               | 7.78               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | 26.32                         | 24.72                                         |

| Laboratory Number. | Name of Brand and Manufacturer.                                                          | Where and from Whom Collected.                       |
|--------------------|------------------------------------------------------------------------------------------|------------------------------------------------------|
| 8647               | H. G. Cottonseed Meal.....<br>PHOENIX COTTON OIL Co.,<br>Como, Miss.                     | Peoples Oil Mill & Fert. Works,<br>Aberdeen .....    |
| 8648               | H. G. Cottonseed Meal.....                                                               | Phoenix Cotton Oil Co., Como.....                    |
| 8649               | H. G. Cottonseed Meal.....                                                               | Phoenix Cotton Oil Co., Como.....                    |
| 8650               | H. G. Cottonseed Meal.....<br>PICKENS COTTON OIL Co.,<br>Pickens, Miss.                  | Phoenix Cotton Oil Co., Como.....                    |
| 8651               | S. G. Cottonseed Meal .....                                                              | Pickens Cotton Oil Co., Pickens.....                 |
| 8868               | S. G. Cottonseed Meal .....                                                              | Pickens Cotton Oil Co., Pickens.....                 |
| 8869               | S. G. Cottonseed Meal .....                                                              | Pickens Cotton Oil Co., Pickens.....                 |
| 8652               | H. G. Cottonseed Meal.....<br>PLANTERS GIN & OIL Co.,<br>Baldwyn, Miss.                  | Planters Gin & Oil Co., Baldwyn.....                 |
| 8653               | H. G. Cottonseed Meal.....                                                               | Philips, Reinhart, Taylor & Co.,<br>Booneville ..... |
| 8654               | H. G. Cottonseed Meal .....                                                              | Planters Gin & Oil Co., Baldwyn.....                 |
| 8655               | H. G. Cottonseed Meal.....<br>PLANTERS OIL MILL & M'F'G.<br>COMPANY,<br>Greenwood, Miss. | Philips, Reinhart, Taylor & Co.,<br>Booneville ..... |
| 8656               | H. G. Cottonseed Meal.....                                                               | Planters Oil Mill & Mfg. Co., Greenw'd               |
| 8657               | H. G. Cottonseed Meal.....                                                               | Planters Oil Mill & Mfg. Co., Greenw'd               |
| 8870               | H. G. Cottonseed Meal.....<br>PLANTERS OIL MILL,<br>Tunica, Miss.                        | Planters Oil Mill & Mfg. Co., Greenw'd               |
| 8658               | H. G. Cottonseed Meal.....                                                               | Planters Oil Mill, Tunica.....                       |
| 8871               | S. G. Cottonseed Meal .....                                                              | Rawls & Lampton Co., Silver Creek....                |
| 8872               | S. G. Cottonseed Meal .....                                                              | Planters Oil Mill, Tunica.....                       |
| 8873               | S. G. Cottonseed Meal .....                                                              | D. C. Griffith & Co., Silver Creek.....              |
| 8659               | S. G. Cottonseed Meal .....                                                              | PLANTERS OIL WORKS,<br>Clarksdale, Miss.             |
| 8660               | S. G. Cottonseed Meal .....                                                              | Planters Oil Works, Clarksdale.....                  |
| 8874               | S. G. Cottonseed Meal .....                                                              | Planters Oil Works, Clarksdale.....                  |
| 8661               | H. G. Cottonseed Meal.....<br>PONTOTOC COTTON OIL Co.,<br>Pontotoc, Miss.                | Planters Oil Works, Clarksdale.....                  |
| 8662               | H. G. Cottonseed Meal.....<br>PORT GIBSON OIL WORKS,<br>Port Gibson, Miss.               | Pontotoc Cotton Oil Co., Pontotoc.....               |
| 8663               | S. G. Cottonseed Meal .....                                                              | Pontotoc Cotton Oil Co., Pontotoc.....               |
| 8664               | S. G. Cottonseed Meal .....                                                              | Port Gibson Oil Works, Port Gibson                   |
| 8665               | S. G. Cottonseed Meal .....                                                              | Port Gibson Oil Works, Port Gibson                   |
| 8666               | S. G. Cottonseed Meal .....                                                              | C. J. Edwards Co., Vicksburg.....                    |
| 8875               | S. G. Cottonseed Meal .....                                                              | Mutual Merc. Co., Utica.....                         |
| 8876               | S. G. Cottonseed Meal .....                                                              | Utica Lumber & Gin Co., Utica.....                   |
|                    |                                                                                          | C. J. Edwards, Vicksburg.....                        |



| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8647               | 8.45               | 6.58               | 7.99                                          | 6.18                 | 7.50                                               | \$ 26.32                      | \$ 24.72                                    |
| 8648               | 8.13               | 6.38               | 7.75                                          | 6.18                 | 7.50                                               | 25.52                         | 24.72                                       |
| 8649               | 8.07               | 6.63               | 8.05                                          | 6.18                 | 7.50                                               | 26.52                         | 24.72                                       |
| 8650               | 5.28               | 6.53               | 7.93                                          | 6.18                 | 7.50                                               | 26.12                         | 24.72                                       |
| 8651               | 9.24               | 6.17               | 7.49                                          | 4.95                 | 6.01                                               | 24.68                         | 19.80                                       |
| 8868               | 7.07               | 5.87               | 7.13                                          | 4.95                 | 6.01                                               | 23.48                         | 19.80                                       |
| 8869               | 8.05               | 6.30               | 7.65                                          | 4.95                 | 6.01                                               | 25.20                         | 19.80                                       |
| 8652               | 7.26               | 7.06               | 8.57                                          | 6.18                 | 7.50                                               | 28.24                         | 24.72                                       |
| 8653               | 8.66               | 6.92               | 8.40                                          | 6.18                 | 7.50                                               | 27.68                         | 24.72                                       |
| 8654               | 8.51               | 6.81               | 8.27                                          | 6.18                 | 7.50                                               | 27.24                         | 24.72                                       |
| 8655               | 8.36               | 6.90               | 8.38                                          | 6.18                 | 7.50                                               | 27.60                         | 24.72                                       |
| 8656               | 7.53               | 6.69               | 8.12                                          | 6.18                 | 7.50                                               | 26.76                         | 24.72                                       |
| 8657               | 7.51               | 6.76               | 8.21                                          | 6.18                 | 7.50                                               | 27.04                         | 24.72                                       |
| 8870               | 8.13               | 5.82               | 7.07                                          | 6.18                 | 7.50                                               | 23.28                         | 24.72                                       |
| 8658               | 7.61               | 6.18               | 7.50                                          | 6.50                 | 7.89                                               | 24.72                         | 26.00                                       |
| 8871               | 6.95               | 6.20               | 7.53                                          | 4.95                 | 6.01                                               | 24.80                         | 19.80                                       |
| 8872               | 4.92               | 6.47               | 7.85                                          | 4.95                 | 6.01                                               | 25.88                         | 19.80                                       |
| 8873               | 7.48               | 6.21               | 7.54                                          | 4.95                 | 6.01                                               | 24.84                         | 19.80                                       |
| 8659               | 9.91               | 6.67               | 8.10                                          | 5.00                 | 6.07                                               | 26.68                         | 20.00                                       |
| 8660               | 7.01               | 6.67               | 8.10                                          | 5.00                 | 6.07                                               | 26.68                         | 20.00                                       |
| 8874               | 6.74               | 6.72               | 8.16                                          | 5.00                 | 6.07                                               | 26.88                         | 20.00                                       |
| 8661               | 9.28               | 7.09               | 8.61                                          | 6.18                 | 7.50                                               | 28.36                         | 24.72                                       |
| 8662               | 9.25               | 6.98               | 8.47                                          | 6.18                 | 7.50                                               | 27.92                         | 24.72                                       |
| 8663               | 8.53               | 6.49               | 7.88                                          | 5.00                 | 6.07                                               | 25.96                         | 20.00                                       |
| 8664               | 7.73               | 6.40               | 7.77                                          | 5.00                 | 6.07                                               | 25.60                         | 20.00                                       |
| 8665               | 8.73               | 6.00               | 7.28                                          | 5.00                 | 6.07                                               | 24.00                         | 20.00                                       |
| 8666               | 8.41               | 6.33               | 7.68                                          | 5.00                 | 6.07                                               | 25.32                         | 20.00                                       |
| 8875               | 6.53               | 6.14               | 7.45                                          | 5.00                 | 6.07                                               | 24.56                         | 20.00                                       |
| 8876               | 7.64               | 6.05               | 7.34                                          | 5.00                 | 6.07                                               | 24.20                         | 20.00                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.         |
|--------------------|----------------------------------------------------------|----------------------------------------|
|                    | PRODUCERS COTTON OIL CO.,<br>Yazoo City, Miss.           |                                        |
| 8667               | H. G. Cottonseed Meal.....                               | Producers Cotton Oil Co., Yazoo City   |
| 8668               | H. G. Cottonseed Meal.....                               | J. R. Gallaspy, Crystal Springs.....   |
| 8877               | H. G. Cottonseed Meal.....                               | O. L. Shaw, Ackerman.....              |
|                    | REFUGE COTTON OIL CO.,<br>Columbus, Miss.                |                                        |
| 8670               | H. G. Cottonseed Meal.....                               | R. G. Harris, Steens.....              |
| 8671               | H. G. Cottonseed Meal.....                               | J. D. McKellar, New Hope.....          |
| 8878               | H. G. Cottonseed Meal.....                               | Refuge Cotton Oil Co., Columbus.....   |
|                    | REFUGE COTTON OIL CO.,<br>Vicksburg, Miss.               |                                        |
| 8669               | S. G. Cottonseed Meal.....                               | Refuge Cotton Oil Co., Greenville..... |
| 8879               | S. G. Cottonseed Meal.....                               | Hanes & Hood, Vicksburg.....           |
| 8880               | S. G. Cottonseed Meal.....                               | Refuge Cotton Oil Co., Greenville..... |
| 8881               | S. G. Cottonseed Meal.....                               | Refuge Cotton Oil Co., Rosedale.....   |
|                    | RODNEY GIN & OIL COMPANY,<br>Rodney, Miss.               |                                        |
| 8882               | H. G. Cottonseed Meal.....                               | Rodney Gin & Oil Co., Rodney.....      |
|                    | ROLLING FORK OIL COMPANY,<br>Rolling Fork, Miss.         |                                        |
| 8883               | H. G. Cottonseed Meal.....                               | Rolling Fork Oil Co., Rolling Fork...  |
| 8884               | H. G. Cottonseed Meal.....                               | Phil H. Feld, Vicksburg.....           |
| 8194               | H. G. Cottonseed Meal.....                               | Philip H. Feld, Vicksburg.....         |
|                    | SARDIS OIL COMPANY,<br>Sardis, Miss.                     |                                        |
| 8672               | H. G. Cottonseed Meal.....                               | Sardis Oil Co., Sardis.....            |
| 8673               | H. G. Cottonseed Meal.....                               | Sardis Oil Co., Sardis.....            |
| 8674               | H. G. Cottonseed Meal.....                               | Sardis Oil Co., Sardis.....            |
|                    | SENATOBIA OIL COMPANY,<br>Senatobia, Miss.               |                                        |
| 8675               | S. G. Cottonseed Meal.....                               | Senatobia Oil Co., Senatobia.....      |
| 8676               | S. G. Cottonseed Meal.....                               | Senatobia Oil Co., Senatobia.....      |
|                    | SHAW COTTON OIL COMPANY,<br>Shaw, Miss.                  |                                        |
| 8677               | S. G. Cottonseed Meal.....                               | Shaw Cotton Oil Co., Shaw.....         |
| 8885               | S. G. Cottonseed Meal.....                               | Shaw Cotton Oil Co., Shaw.....         |
|                    | SHELBY OIL COMPANY,<br>Shelby, Miss.                     |                                        |
| 8886               | H. G. Cottonseed Meal.....                               | Shelby Oil Company, Shelby.....        |
|                    | SHUBUTA OIL & M'F'G. Co.,<br>Shubuta, Miss.              |                                        |
| 8678               | H. G. Cottonseed Meal.....                               | Shubuta Oil & M'f'g. Co., Shubuta...   |
| 8887               | H. G. Cottonseed Meal.....                               | W. P. Hodges, DeSoto.....              |
|                    | SOUTHERN OIL & FERTILIZER<br>COMPANY,<br>Meridian, Miss. |                                        |
| 8679               | H. G. Cottonseed Meal.....                               | Southern Oil & Fert. Co., Meridian...  |
| 8680               | H. G. Cottonseed Meal.....                               | Meyer Bros., Meridian.....             |
| 8681               | H. G. Cottonseed Meal.....                               | Southern Oil & Fert. Co., Meridian...  |
| 8682               | H. G. Cottonseed Meal.....                               | Winner, Klein & Co., Meridian.....     |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8667               | 7.73               | 6.64               | 8.06                                          | 6.18                 | 7.50                                               | \$ 26.56                      | \$ 24.72                                    |
| 8668               | 8.34               | 6.11               | 7.42                                          | 6.18                 | 7.50                                               | 24.44                         | 24.72                                       |
| 8877               | 7.50               | 6.34               | 7.70                                          | 6.18                 | 7.50                                               | 25.36                         | 24.72                                       |
| 8670               | 8.43               | 6.79               | 8.24                                          | 6.18                 | 7.50                                               | 27.16                         | 24.72                                       |
| 8671               | 9.02               | 6.48               | 7.87                                          | 6.18                 | 7.50                                               | 25.92                         | 24.72                                       |
| 8878               | 6.68               | 6.73               | 8.17                                          | 6.18                 | 7.50                                               | 26.92                         | 24.72                                       |
| 8669               | 9.29               | 6.29               | 7.64                                          | 4.95                 | 6.01                                               | 25.16                         | 19.80                                       |
| 8879               | 8.35               | 5.83               | 7.08                                          | 4.95                 | 6.01                                               | 23.32                         | 19.80                                       |
| 8880               | 7.94               | 6.42               | 7.79                                          | 4.95                 | 6.01                                               | 25.68                         | 19.80                                       |
| 8881               | 7.79               | 6.09               | 7.39                                          | 4.95                 | 6.01                                               | 24.36                         | 19.80                                       |
| 8882               | 10.27              | 6.23               | 7.56                                          | 6.25                 | 7.59                                               | 24.92                         | 25.00                                       |
| 8883               | 6.85               | 6.59               | 8.00                                          | 6.73                 | 8.17                                               | 26.36                         | 26.92                                       |
| 8884               | 7.24               | 6.83               | 8.29                                          | 6.73                 | 8.17                                               | 27.32                         | 26.92                                       |
| 8194               | 7.72               | 6.79               | 8.24                                          | 6.73                 | 8.17                                               | 27.16                         | 25.92                                       |
| 8672               | 7.36               | 6.28               | 7.62                                          | 6.20                 | 7.53                                               | 25.12                         | 24.80                                       |
| 8673               | 6.94               | 6.66               | 8.09                                          | 6.20                 | 7.53                                               | 26.64                         | 24.80                                       |
| 8674               | 7.51               | 6.47               | 7.85                                          | 6.20                 | 7.53                                               | 25.88                         | 24.80                                       |
| 8675               | 7.86               | 6.60               | 8.01                                          | 4.95                 | 6.01                                               | 26.40                         | 19.80                                       |
| 8676               | 8.53               | 6.65               | 8.07                                          | 4.95                 | 6.01                                               | 26.60                         | 19.80                                       |
| 8677               | 6.91               | 6.62               | 8.04                                          | 5.50                 | 6.68                                               | 26.48                         | 22.00                                       |
| 8885               | 7.29               | 6.41               | 7.78                                          | 5.50                 | 6.68                                               | 25.64                         | 22.00                                       |
| 8886               | 8.59               | 6.27               | 7.61                                          | 6.18                 | 7.50                                               | 25.08                         | 24.72                                       |
| 8678               | 9.10               | 6.98               | 8.47                                          | 6.18                 | 7.50                                               | 27.92                         | 24.72                                       |
| 8887               | 8.33               | 7.04               | 8.55                                          | 6.18                 | 7.50                                               | 28.16                         | 24.72                                       |
| 8679               | 8.44               | 6.82               | 8.28                                          | 6.18                 | 7.50                                               | 27.28                         | 24.72                                       |
| 8680               | 7.93               | 6.78               | 8.23                                          | 6.18                 | 7.50                                               | 27.12                         | 24.72                                       |
| 8681               | 8.48               | 6.23               | 7.56                                          | 6.18                 | 7.50                                               | 24.92                         | 24.72                                       |
| 8682               | 4.03               | 6.65               | 8.07                                          | 6.18                 | 7.50                                               | 26.60                         | 24.72                                       |

| Laboratory Number. | Name of Brand and Manufacturer.                                                     | Where and from Whom Collected.         |
|--------------------|-------------------------------------------------------------------------------------|----------------------------------------|
| 8683               | H. G. Cottonseed Meal.....<br>STARKVILLE COTTON OIL Co.,<br>Starkville, Miss.       | T. F. Abney, Montrose.....             |
| 8888               | H. G. Cottonseed Meal.....<br>SUMMIT GIN & IMPROVEMENT<br>COMPANY,<br>Summit, Miss. | Davis Bros., Ocean Springs.....        |
| 8684               | H. G. Cottonseed Meal.....                                                          | Summit Gin & Imp. Co., Summit.....     |
| 8685               | H. G. Cottonseed Meal.....                                                          | J. L. Moyse & Bro., Summit.....        |
| 8686               | H. G. Cottonseed Meal.....<br>TENNESSEE COTTON OIL Co.,<br>Memphis, Tenn.           | Hyman Merc. Co., Summit.....           |
| 8687               | H. G. Cottonseed Meal.....<br>TENNESSEE FIBER COMPANY,<br>Memphis, Tenn.            | C. M. Elder, New Albany.....           |
| 8688               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Miss. Grocery Co., Gulfport.....       |
| 8689               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Threefoot Bros. & Co., Meridian.....   |
| 8690               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Threefoot Bros. & Co., Meridian.....   |
| 8691               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | C. W. McKnight, Iuka.....              |
| 8692               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | W. W. Conty, Scranton.....             |
| 8889               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | H. B. Lewis & Co., Columbia.....       |
| 8890               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | The Rankin Co., Columbia.....          |
| 8891               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | The Lampton Co., Columbia.....         |
| 8892               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Barnes & Co., Columbia.....            |
| 8893               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Foote & Drummond, Columbia.....        |
| 8894               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Union Novel Stores Co., Gulfport.....  |
| 8895               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Gulfport Grain & Elevator Co., G'port  |
| 8896               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Gulfport Grocery Co., Gulfport.....    |
| 8897               | Creamo Brand O. G. Cotton-<br>seed Meal .....                                       | Ruffin Merc. Co., Ellisville.....      |
| 8342               | Creamo Brand O. G.<br>Cottonseed Meal .....                                         | The De-Jean-Mitchell Co., Scranton.... |
|                    | TUPELO OIL & ICE COMPANY,<br>Tupelo, Miss.                                          |                                        |
| 8696               | H. G. Cottonseed Meal.....<br>VICKSBURG COTTON OIL Co.,<br>Vicksburg, Miss.         | Tupelo Oil & Ice Co., Tupelo.....      |
| 8902               | H. G. Cottonseed Meal.....                                                          | Johnson-Hand Co., Ellisville.....      |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8683               | 8.65               | 6.70               | 8.13                                          | 6.18                 | 7.50                                               | \$ 26.80                      | \$ 24.72                                    |
| 8888               | 8.56               | 6.75               | 8.19                                          | 6.18                 | 7.50                                               | 27.00                         | 24.72                                       |
| 8684               | 6.71               | 6.71               | 8.15                                          | 6.18                 | 7.50                                               | 26.84                         | 24.72                                       |
| 8685               | 7.07               | 7.19               | 8.73                                          | 6.18                 | 7.50                                               | 28.76                         | 24.72                                       |
| 8686               | 7.40               | 7.11               | 8.63                                          | 6.18                 | 7.50                                               | 28.44                         | 24.72                                       |
| 8687               | 9.65               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |
| 8688               | 8.87               | 4.51               | 5.48                                          | 3.52                 | 4.27                                               | 18.04                         | 14.08                                       |
| 8689               | 10.12              | 3.78               | 4.59                                          | 3.52                 | 4.27                                               | 15.12                         | 14.08                                       |
| 8690               | 9.61               | 2.94               | 3.57                                          | 3.52                 | 4.27                                               | 11.76                         | 14.08                                       |
| 8691               | 10.29              | 3.58               | 4.35                                          | 3.52                 | 4.27                                               | 14.32                         | 14.08                                       |
| 8692               | 10.11              | 3.53               | 4.29                                          | 3.52                 | 4.27                                               | 14.12                         | 14.08                                       |
| 8889               | 9.65               | 4.41               | 5.35                                          | 3.52                 | 4.27                                               | 17.64                         | 14.08                                       |
| 8890               | 9.22               | 3.88               | 4.71                                          | 3.52                 | 4.27                                               | 15.52                         | 14.08                                       |
| 8891               | 8.58               | 3.50               | 4.25                                          | 3.52                 | 4.27                                               | 14.00                         | 14.08                                       |
| 8892               | 9.34               | 3.88               | 4.71                                          | 3.52                 | 4.27                                               | 15.52                         | 14.08                                       |
| 8893               | 9.54               | 3.58               | 4.35                                          | 3.52                 | 4.27                                               | 14.32                         | 14.08                                       |
| 8894               | 9.44               | 3.77               | 4.58                                          | 3.52                 | 4.27                                               | 15.08                         | 14.08                                       |
| 8895               | 10.12              | 3.61               | 4.38                                          | 3.52                 | 4.27                                               | 14.44                         | 14.08                                       |
| 8896               | 9.52               | 3.62               | 4.39                                          | 3.52                 | 4.27                                               | 14.48                         | 14.08                                       |
| 8897               | 9.61               | 3.44               | 4.18                                          | 3.52                 | 4.27                                               | 13.76                         | 14.08                                       |
| 8342               | 8.85               | 3.65               | 4.43                                          | 3.52                 | 4.27                                               | 14.60                         | 14.08                                       |
| 8696               | 8.84               | 6.94               | 8.43                                          | 6.18                 | 7.50                                               | 27.76                         | 24.72                                       |
| 8902               | 9.43               | 6.57               | 7.98                                          | 6.18                 | 7.50                                               | 26.28                         | 24.72                                       |



| Laboratory Number. | Name of Brand and Manufacturer.                             | Where and from Whom Collected.         |
|--------------------|-------------------------------------------------------------|----------------------------------------|
| 8903               | H. G. Cottonseed Meal.....                                  | Lucedale Commercial Co., Lucedale....  |
| 8904               | H. G. Cottonseed Meal.....                                  | Meyer Bros., Meridian.....             |
| 8906               | H. G. Cottonseed Meal.....                                  | Southern Oil & Fert. Co., Meridian.... |
| 8697               | S. G. Cottonseed Meal .....                                 | E. E. Bonner, Sandersville.....        |
| 8907               | S. G. Cottonseed Meal .....                                 | Winner, Klein & Co., Meridian.....     |
|                    | WINONA OIL & M'F'G. Co.,<br>Winona, Miss.                   |                                        |
| 8698               | H. G. Cottonseed Meal.....                                  | Winona Oil & M'f'g. Co., Winona.....   |
| 8699               | H. G. Cottonseed Meal.....                                  | Winona Oil & M'f'g. Co., Winona.....   |
| 8700               | H. G. Cottonseed Meal.....                                  | Winona Oil & M'f'g. Co., Winona.....   |
| 8701               | H. G. Cottonseed Meal.....                                  | Winona Oil & M'f'g. Co., Winona.....   |
|                    | J. LINDSAY WELLS COMPANY,<br>Memphis, Tenn.                 |                                        |
| 8702               | H. G. Star Brand Cotton-<br>seed Meal .....                 | Wm. Atchinson & McDonald, Wesson       |
| 8600               | H. G. Star Brand C-S. Meal ..                               | W. A. McDonald, Bay St. Louis.....     |
| 8043               | S. G. Cottonseed Meal .....                                 | J. S. Allred, Hazlehurst.....          |
| 8066               | S. G. Cottonseed Meal .....                                 | Bolion Merc. Co., Bogue Chitto.....    |
| 8191               | S. G. Cottonseed Meal .....                                 | Gilmore, Puckett Grocery Co., Amory    |
| 8192               | S. G. Cottonseed Meal .....                                 | Gilmore, Puckett Grocery Co., Amory    |
| 8908               | O. G. Cottonseed Meal 3% ....                               | R. L. Davis, Brookhaven.....           |
| 8909               | O. G. Cottonseed Meal 3% ....                               | R. L. Davis, Brookhaven.....           |
|                    | WESSON COTTON OIL &<br>FERTILIZER COMPANY,<br>Wesson, Miss. |                                        |
| 8703               | H. G. Cottonseed Meal.....                                  | Wesson Cotton Oil & Fert. Co., Wesson  |
| 8704               | H. G. Cottonseed Meal.....                                  | Wm. Atchinson & McDonald, Wesson       |
| 8705               | H. G. Cottonseed Meal.....                                  | Wesson Cotton Oil & Fert Co., Wesson   |
| 8706               | H. G. Cottonseed Meal.....                                  | Wesson Cotton Oil & Fert Co., Wesson   |
|                    | WOODVILLE OIL & M'F'G. Co.,<br>Woodville, Miss.             |                                        |
| 8707               | S. G. Cottonseed Meal .....                                 | Woodville Oil & M'f'g. Co., Woodville  |
| 8905               | S. G. Cottonseed Meal .....                                 | Woodville Oil & M'f'g. Co., Woodville  |

| Laboratory Number. | Moisture—Per Cent. | Nitrogen—Per Cent. | Ammonia—<br>equivalent of Nitrogen<br>—Found. | Nitrogen Guaranteed. | Ammonia—<br>equivalent of Nitrogen<br>—Guaranteed. | Value of Nitrogen<br>Per Ton. | Value of Nitrogen<br>Guaranteed<br>Per Ton. |
|--------------------|--------------------|--------------------|-----------------------------------------------|----------------------|----------------------------------------------------|-------------------------------|---------------------------------------------|
| 8903               | 9.45               | 6.35               | 7.71                                          | 6.18                 | 7.50                                               | 25.40                         | 24.72                                       |
| 8904               | 10.14              | 6.17               | 7.49                                          | 6.18                 | 7.50                                               | 24.68                         | 24.72                                       |
| 6905               | 9.48               | 6.38               | 7.75                                          | 6.18                 | 7.50                                               | 25.52                         | 24.72                                       |
| 8697               | 10.41              | 6.29               | 7.64                                          | 5.00                 | 6.07                                               | 25.16                         | 20.00                                       |
| 8907               | 9.17               | 6.35               | 7.71                                          | 5.00                 | 6.07                                               | 25.40                         | 20.00                                       |
| 8698               | 8.50               | 7.09               | 8.61                                          | 6.18                 | 7.50                                               | 28.36                         | 24.72                                       |
| 8699               | 7.18               | 6.87               | 8.34                                          | 6.18                 | 7.50                                               | 27.48                         | 24.72                                       |
| 8700               | 8.41               | 6.95               | 8.44                                          | 6.18                 | 7.50                                               | 27.80                         | 24.72                                       |
| 8701               | 8.84               | 7.12               | 8.64                                          | 6.18                 | 7.50                                               | 28.48                         | 24.72                                       |
| 8702               | 9.38               | 6.34               | 7.70                                          | 6.18                 | 7.50                                               | 25.36                         | 24.72                                       |
| 8600               | 8.00               | 6.49               | 7.88                                          | 6.18                 | 7.50                                               | 25.96                         | 24.72                                       |
| 8043               | 8.62               | 4.23               | 5.14                                          | 4.95                 | 6.01                                               | 16.92                         | 19.80                                       |
| 8066               | 8.57               | 3.26               | 3.96                                          | 4.95                 | 6.01                                               | 13.04                         | 19.80                                       |
| 8191               | 10.06              | 3.33               | 4.04                                          | 4.95                 | 6.01                                               | 13.32                         | 19.80                                       |
| 8192               | 10.37              | 3.22               | 3.91                                          | 4.95                 | 6.01                                               | 12.88                         | 19.80                                       |
| 8908               | 5.42               | 3.08               | 3.74                                          | 3.00                 | 3.64                                               | 12.32                         | 12.00                                       |
| 8909               | 10.26              | 3.38               | 4.10                                          | 3.00                 | 3.64                                               | 13.52                         | 12.00                                       |
| 8703               | 8.72               | 7.14               | 8.67                                          | 6.18                 | 7.50                                               | 28.56                         | 24.72                                       |
| 8704               | 9.00               | 6.94               | 8.43                                          | 6.18                 | 7.50                                               | 27.76                         | 24.72                                       |
| 8705               | 7.13               | 6.93               | 8.41                                          | 6.18                 | 7.50                                               | 27.72                         | 24.72                                       |
| 8706               | 7.48               | 6.77               | 8.22                                          | 6.18                 | 7.50                                               | 27.08                         | 24.72                                       |
| 8707               | 8.22               | 6.77               | 8.22                                          | 5.75                 | 6.98                                               | 27.08                         | 23.00                                       |
| 8905               | 8.33               | 6.48               | 7.87                                          | 5.75                 | 6.98                                               | 25.92                         | 23.00                                       |



Mississippi Agricultural Experiment Station.

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BULLETIN NO. 115.

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INSPECTION AND ANALYSES  
OF COMMERCIAL FERTILIZERS  
ON SALE IN THE STATE



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI,

NOVEMBER, 1908.



MISSISSIPPI FERTILIZER AND FEEDING  
STUFF CONTROL.



Inspection and Analyses of Fertilizers  
BY THE CHEMICAL DEPARTMENT OF THE  
Mississippi Agricultural and Mechanical College.



|                       |                                            |
|-----------------------|--------------------------------------------|
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# INSPECTION AND ANALYSES OF COMMERCIAL FERTILIZERS ON SALE IN THE STATE.

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**Introduction.**—The general results of the inspection of fertilizers for the season of 1907-1908 are collected and published in this bulletin which has been preceded by circulars Nos. 25 and 26, containing analyses of samples drawn by inspectors during the months of heaviest shipments. While the Department desires to distribute these circulars in January, February and March, of each year, it was scarcely practicable to issue more than two of them during the season, on account of the rather inactive movement of fertilizers in December and early January, and the consequent difficulty encountered by inspectors in securing promptly samples in sufficient number and variety.

It is doubtless hardly necessary to direct attention again to the fact that a fair and efficient inspection must rest primarily upon the representative character of the samples secured by inspectors and upon the accuracy of the analytical work. The samples represented by analyses in these tables have been drawn from goods at from practically all important centers of distribution in the state. So far as possible, the analytical work is equitably distributed over the territory and between the various brands found upon the markets by the regular inspectors employed by the Department. The more popular brands are more prominently represented, therefore, and the average of a large number of analyses of samples representing fertilizer supplied under these brand names presents in a very certain way an accurate measure of the plant food which the purchaser may feel that he is securing when buying them.

An inspection of the tables will show that some samples do not contain as much plant food as the manufacturer guarantees to place in the fertilizer. The majority, of course, contain as great or a greater amount of the valuable constituents guaranteed to be present. In all cases the analyses are reported to the dealer and the manufacturer, and attention directed to discrepancies which the chemical examinations may bring to light.

**General results of the inspection.**—This bulletin contains a somewhat larger number of analyses than were made during last year, the total sales of fertilizer in the state being only a few tons more. The

following classification of the samples illustrates the distribution and range of the analytical work for the two seasons:

|                                   | SEASON<br>1906-1907. | SEASON<br>1907-1908. |
|-----------------------------------|----------------------|----------------------|
| Complete fertilizers .....        | 355                  | 345                  |
| Acid phosphates .....             | 123                  | 148                  |
| Acid phosphates with potash ..... | 9                    | 4                    |
| Ground Bones .....                | 5                    | 3                    |
| Potash salts .....                | 14                   | 24                   |
| Miscellaneous samples .....       |                      | 2                    |
| Totals.....                       | 506                  | 526                  |

The trade generally cannot fail to find much that is disappointing when these analyses are carefully compared with those of previous seasons. Last year 506 analyses were published and 64 (12.64%) we found more or less deficient in the relative value computed from the manufacturers' guaranties, while out of a total of 526 analyses made this season, 117 (22.24%) are similarly deficient. In many cases the variation from the guaranty is small enough to be unimportant, but the general result reveals unmistakably a lack of care or a lack of control over conditions which the best interest of the purchaser can scarcely permit. The desirability of a greater margin of safety is very frequently emphasized throughout the tables, and this can be secured, of course, only by lowering guaranties in a number of cases, or by the use of better raw materials.

The published results of analyses of samples representing brands of high grade mixtures and fertilizer materials found uniformly above the guaranties carried by them are significant from the standpoint of farmers in this state, who expect the fertilizers bought by them to contain the plant food claimed; for only by a consideration of guaranties in connection with these tables of analyses may the purchaser determine with reasonable accuracy the cost per pound of the valuable constituents in the fertilizers offered.

The following table is inserted as a comparative statement of the general results of the inspection for the past few years:



|                        | Number of<br>Samples Analyzed. | Number found<br>below<br>Guarantee in<br>Relative Value. | Percentage found<br>below<br>Guarantee in<br>Relative Value. |
|------------------------|--------------------------------|----------------------------------------------------------|--------------------------------------------------------------|
| Season 1902-1903 ..... | 262                            | 28                                                       | 10.68                                                        |
| Season 1903-1904 ..... | 280                            | 42                                                       | 15.00                                                        |
| Season 1904-1905 ..... | 399                            | 35                                                       | 8.77                                                         |
| Season 1905-1906 ..... | 437                            | 33                                                       | 7.55                                                         |
| Season 1906-1907 ..... | 506                            | 64                                                       | 12.64                                                        |
| Season 1907-1908 ..... | 526                            | 117                                                      | 22.24                                                        |

It is clear, therefore, that the results for 1907-1908 compare rather unfavorably with those of previous years as far back as 1902-1903, surpassing in percentage of low samples even season of 1903-1904.

A more detailed review of the results secured in the examination of samples of fertilizer manufactured by the various companies doing business in the state will be found in tabular form on pages 8 and 9 of this bulletin, and this table may be accepted as an accurate and condensed review of the work of the entire season

**The purchase of fertilizers.**—It may not be necessary to point out again that the price asked for a ton of fertilizer may or may not bear a proper relation to its actual value. In every case, the farmer must first ascertain the kind and amount of plant food contained in a ton before he can compute the price which he is to pay for each pound of the constituents which fix the value of the fertilizer. If, for example, an acid phosphate containing 12% of available phosphoric acid is offered for \$13.20 a ton, the available phosphoric acid will cost 5½ cents a pound, since there are 240 pounds of it in a ton of the material. On the same basis, he can well afford to pay \$17.60 for a ton of 16% acid phosphate, for the price per pound of available phosphoric acid is the same in the two grades.

The composition of all fertilizer sold in the state may be found in these bulletin which give manufacturer's guaranties and analyses of a large number of samples. All purchases, therefore, of established brands, should be based upon the data supplied by these bulletins.

**Fertilizers of low grades.**—Those farmers and dealers who protect their interest carefully by first computing the *cost per pound* of the



several forms of plant food in a fertilizer *before* buying will not allow low grade mixtures which are sold at a low price per gross ton to compete successfully with the high grade brands of reliable manufacturers. The law itself prohibits the sale of any fertilizer containing less than 12 per cent. of plant food. *If there is a tendency on the part of some dealers and farmers to create a demand for low grade mixtures, it is certainly due to an incorrect idea of the actual value of fertilizers. The cost per pound of available phosphoric acid, nitrogen, and potash, in high grade goods will be found lower doubtless than in the inferior mixtures.*

It should be repeated also that the purchase of mixtures carrying on small amounts of nitrogen and potash associated with rather high percentages of phosphoric acid is not to be advised. It is usually better to buy an acid phosphate at once.

**Uniformity in Composition.**—The raw materials employed by manufacturers are not invariable in composition, and it would be too much to expect the mixtures made from them to show an absolute uniformity in composition. It is certainly always practicable, however, to maintain the essential character of a certain brand, and while the deficiency in one constituent may be compensated for in some degree by a corresponding excess of another, such an adjustment of values is necessarily limited from the standpoint of the farmer himself whose interest demands, of course, a reasonable conformity to the guaranty on the basis of which purchase is made.

**Schedule of values.**—The following schedule has been used in computing relative commercial value for the seasons of 1907-1908. These figures are intended to approximate the relative market values of the constituents of fertilizers. The method of using them in comparing the values of different grades of fertilizer has been explained. The actual cost of fertilizer to the farmer is regulated, of course, by trade conditions; these values have a comparative significance only:

|                                                       | per lb. per unit. |        |
|-------------------------------------------------------|-------------------|--------|
| For Nitrogen.....                                     | 20c               | \$4.00 |
| For Water Soluble Phosphoric Acid in mixed goods      | 6c                | 1.20   |
| For Citrate-Soluble Phosphoric Acid in mixed goods    | 5½c               | 1.10   |
| For Water-Soluble Phosphoric Acid in plain Acid Phos. | 5½c               | 1.10   |
| For Citrate-Soluble Phosphoric Acid in plain          |                   |        |
| Acid Phosphates .....                                 | 5c                | 1.00   |
| For Total Phosphoric Acid in fine bone .....          | 3c                | .60    |
| For Total Phosphoric Acid in medium and coarse bone   | 2½c               | .50    |
| For Potash .....                                      | 5¾c               | 1.15   |

The following example will illustrate the use of the above schedule in computing the relative commercial values as given in this bulletin:

|                                  | Per Cent. | Pounds in<br>a Ton. | Price per<br>Pound. | Value.   |
|----------------------------------|-----------|---------------------|---------------------|----------|
| Water-Soluble Phos. Acid .....   | 8.00      | 160                 | 6c                  | \$9.60   |
| Citrate-Soluble Phos. Acid ..... | 2.00      | 40                  | 5½c                 | 2.20     |
| Nitrogen .....                   | 1.65      | 33                  | 20c                 | 6.60     |
| Potash .....                     | 2.00      | 40                  | 5¾c                 | 2.30     |
| Relative value of a ton .....    |           |                     |                     | \$ 20.70 |

**Tables of analyses.**—Table I presents a general summary of the results of the analyses of samples of goods sold by manufacturers doing business in this State.

Table II contains the analyses of samples drawn by inspectors. These results form a reliable index of the character of the fertilizer supplied under the various brand names.

Table III will show the guaranty of the manufacturer for each brand of fertilizer registered for sale during the season. Analyses of samples (received from manufacturers) representing these brands are also included in this table. All manufacturers and dealers have promptly complied with the provisions of the fertilizer law.

TABLE I.—SUMMARY OF RESULTS IN TABLE II.

| NAME AND ADDRESS OF MANUFACTURER.                                             | Number of Samples Analyzed. | Number of Samples equal to or above guarantee in Available Phosphoric Acid, Nitrogen, and Potash. | Number of Samples found as much as five per cent. below guarantee in Available Phosphoric Acid. | Number of Samples found as much as eight per cent. below guarantee in Nitrogen. | Number of Samples found as much as three per cent. below guarantee in Potash. | Number of Samples found as much in Relative Commercial Value. | Number of Samples found to or above guarantee in Relative Commercial Value. |
|-------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------|
|                                                                               |                             |                                                                                                   |                                                                                                 |                                                                                 |                                                                               |                                                               |                                                                             |
| ALABAMA CHEMICAL COMPANY, Montgomery, Ala. ....                               | 7                           | 3                                                                                                 | 0                                                                                               | 3                                                                               | 0                                                                             | 0                                                             | 6                                                                           |
| AMERICAN GUANO COMPANY, Nashville, Tenn. ....                                 | 3                           | 0                                                                                                 | 1                                                                                               | 1                                                                               | 0                                                                             | 2                                                             | 0                                                                           |
| ARMOUR FERTILIZER WORKS, Atlanta, Ga. ....                                    | 1                           | 0                                                                                                 | 0                                                                                               | 0                                                                               | 0                                                                             | 0                                                             | 1                                                                           |
| BIRMINGHAM FERTILIZER COMPANY, Birmingham, Ala. ....                          | 14                          | 9                                                                                                 | 0                                                                                               | 2                                                                               | 1                                                                             | 0                                                             | 12                                                                          |
| BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss. ....                | 8                           | 1                                                                                                 | 0                                                                                               | 0                                                                               | 1                                                                             | 0                                                             | 6                                                                           |
| CANTON OIL MILL CO., Canton, Miss. ....                                       | 5                           | 4                                                                                                 | 0                                                                                               | 0                                                                               | 0                                                                             | 0                                                             | 5                                                                           |
| CAPITAL FERTILIZER & M'F'G. COMPANY, Jackson, Miss. ....                      | 31                          | 19                                                                                                | 1                                                                                               | 1                                                                               | 1                                                                             | 2                                                             | 28                                                                          |
| CLINTON COTTON OIL & M'F'G. CO., Clinton, La. ....                            | 4                           | 3                                                                                                 | 0                                                                                               | 0                                                                               | 0                                                                             | 0                                                             | 4                                                                           |
| CRYSTAL SPRINGS OIL MILL & FERTILIZER M'F'G. CO., Crystal Springs, Miss. .... | 9                           | 2                                                                                                 | 0                                                                                               | 1                                                                               | 0                                                                             | 0                                                             | 7                                                                           |
| EAGLE COTTON OIL CO., Meridian, Miss. ....                                    | 8                           | 4                                                                                                 | 1                                                                                               | 1                                                                               | 0                                                                             | 1                                                             | 6                                                                           |
| FEDERAL CHEMICAL CO., Louisville, Ky. ....                                    | 7                           | 4                                                                                                 | 0                                                                                               | 0                                                                               | 1                                                                             | 0                                                             | 7                                                                           |
| FLORENCE COTTON OIL CO., Florence, Ala. ....                                  | 2                           | 1                                                                                                 | 0                                                                                               | 1                                                                               | 0                                                                             | 0                                                             | 2                                                                           |
| GREAT SOUTHERN PHOSPHATE CO., Mt. Pleasant, Tenn. ....                        | 13                          | 6                                                                                                 | 0                                                                                               | 0                                                                               | 2                                                                             | 2                                                             | 9                                                                           |
| GULFPORT COTTON OIL, FERTILIZER & M'F'G. CO., Gulfport, Miss. ....            | 22                          | 17                                                                                                | 1                                                                                               | 1                                                                               | 1                                                                             | 0                                                             | 21                                                                          |
| HAZLEHURST OIL MILL & FERTILIZER CO., Hazlehurst, Miss. ....                  | 10                          | 5                                                                                                 | 0                                                                                               | 1                                                                               | 0                                                                             | 0                                                             | 8                                                                           |
| INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss. ....                      | 2                           | 1                                                                                                 | 0                                                                                               | 0                                                                               | 0                                                                             | 0                                                             | 2                                                                           |
| JACKSON FERTILIZER CO., Jackson, Miss. ....                                   | 55                          | 37                                                                                                | 3                                                                                               | 3                                                                               | 5                                                                             | 2                                                             | 49                                                                          |



|                                                        |     |       |      |       |       |      |       |    |
|--------------------------------------------------------|-----|-------|------|-------|-------|------|-------|----|
| JEFFERSON FERTILIZER Co., Birmingham, Ala.             | 3   | 0     | 2    | 0     | 0     | 0    | 1     | 1  |
| KOSCIUSKO OIL MILL & FERTILIZER Co., Kosciusko.        | 8   | 7     | 0    | 0     | 0     | 0    | 0     | 8  |
| LAUREL OIL & FERTILIZER Co., Laurel, Miss.             | 18  | 10    | 2    | 2     | 0     | 0    | 2     | 15 |
| LOTTERHOS & HUBER Co., Crystal Springs, Miss.          | 1   | 1     | 0    | 0     | 0     | 0    | 0     | 1  |
| MARBACH & EAGAN, Crystal Springs, Miss.                | 1   | 1     | 0    | 0     | 0     | 0    | 0     | 1  |
| P. B. MATHIASON M'f'g. Co., St. Louis, Mo.             | 2   | 0     | 0    | 0     | 1     | 0    | 1     | 1  |
| MERIDIAN FERTILIZER FACTORY, Meridian, Miss.           | 87  | 54    | 6    | 7     | 0     | 0    | 6     | 67 |
| MISSISSIPPI FERTILIZER Co., Jackson, Miss.             | 13  | 4     | 1    | 3     | 0     | 0    | 2     | 8  |
| MR. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.       | 10  | 5     | 0    | 0     | 0     | 2    | 0     | 7  |
| NEW ORLEANS ACID & FERTILIZER Co., New Orleans, La.    | 21  | 4     | 6    | 3     | 3     | 3    | 9     | 7  |
| NEWTON OIL & M'f'g. Co., Newton, Miss.                 | 10  | 5     | 0    | 3     | 1     | 1    | 1     | 7  |
| PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La.   | 6   | 1     | 0    | 1     | 3     | 2    | 3     | 3  |
| REFUGE COTTON OIL Co., Columbus, Miss.                 | 13  | 2     | 4    | 1     | 2     | 2    | 3     | 9  |
| SHUBUTA OIL & M'f'g. Co., Shubuta, Miss.               | 4   | 1     | 3    | 0     | 0     | 0    | 2     | 2  |
| SOUTHERN OIL & FERTILIZER Co., Meridian, Miss.         | 9   | 3     | 2    | 1     | 1     | 1    | 1     | 6  |
| STANDARD GUANO & CHEMICAL M'f'g. Co., New Orleans, La. | 25  | 14    | 1    | 1     | 0     | 0    | 4     | 20 |
| SWIFT FERTILIZER WORKS, Atlanta, Ga.                   | 6   | 0     | 0    | 1     | 3     | 1    | 1     | 3  |
| TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.           | 3   | 2     | 0    | 1     | 0     | 0    | 1     | 2  |
| TENNESSEE VALLEY FERTILIZER Co., Florence, Ala.        | 4   | 0     | 0    | 4     | 0     | 0    | 0     | 3  |
| THREEFOOT BROS. & Co., Meridian, Miss.                 | 6   | 4     | 0    | 0     | 0     | 0    | 0     | 5  |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss.               | 21  | 13    | 1    | 1     | 1     | 1    | 3     | 17 |
| VIRGINIA CAROLINA CHEMICAL Co., Memphis, Tenn.         | 51  | 26    | 2    | 12    | 4     | 4    | 4     | 40 |
| WESSON COTTON OIL & FERTILIZER Co., Wesson, Miss.      | 3   | 2     | 0    | 0     | 0     | 0    | 0     | 3  |
| Totals                                                 | 526 | 275   | 37   | 57    | 32    | 52   | 409   |    |
| Percentages                                            |     | 52.28 | 7.37 | 16.28 | 8.53  | 9.88 | 77.76 |    |
| Totals for Season 1906-1907                            | 506 | 285   | 27   | 47    | 47    | 29   | 442   |    |
| Percentages for Season 1906-1907                       |     | 56.32 | 5.33 | 13.35 | 12.43 | 5.73 | 87.35 |    |
| Totals for Season 1905-1906                            | 437 | 246   | 16   | 66    | 15    | 15   | 404   |    |
| Percentages for Season 1905-1906                       |     | 56.29 | 3.78 | 19.64 | 4.36  | 3.43 | 92.45 |    |



| Laboratory Number. | Name of Brand and Manufacturer.                | Where and from Whom Collected.                                  |
|--------------------|------------------------------------------------|-----------------------------------------------------------------|
|                    | ALABAMA CHEMICAL Co.,<br>Montgomery, Ala.      |                                                                 |
| 8160               | H. G. Rex Dissolved Bone.....                  | W. G. Peugh, Aberdeen.....                                      |
| 8910               | H. G. Rex Dissolved Bone.....                  | A. Roberts & Co., Lauderdale.....<br>Guarantee.....             |
| 8737               | S. G. Big Boll Guano.....                      | A. B. Norris, West Point.....<br>Guarantee.....                 |
| 8911               | S. G. Liberty Bell Blood<br>and Bone.....      | Tidwell & McCormick, Hickory.....                               |
| 8912               | S. G. Liberty Bell Blood<br>and Bone.....      | J. H. Shepherd, Houston.....<br>Guarantee.....                  |
| 8161               | S. G. Success Mixture.....                     | W. G. Peugh, Aberdeen.....                                      |
| 8913               | S. G. Success Mixture.....                     | Watts Merc. Co., Sandersville.....<br>Guarantee.....            |
|                    | AMERICAN GUANO Co.,<br>Nashville, Tenn.        |                                                                 |
| 8162               | H. G. Dissolved Bone.....                      | Bourland Bros., Amory.....<br>Guarantee.....                    |
| 8163               | S. G. Bourland's Cotton<br>Grower .....        | Bourland Bros., Amory.....                                      |
| 8914               | S. G. Bourland's Cotton<br>Grower .....        | Bourland Bros., Amory .....                                     |
|                    | ARMOUR FERTILIZER WORKS,<br>Atlanta, Ga.       |                                                                 |
| 8915               | S. G. Shield Brand King<br>Cotton Grower ..... | Bourland Bros., Amory.....<br>Guarantee.....                    |
|                    | BIRMINGHAM FERTILIZER Co.,<br>Birmingham, Ala. |                                                                 |
| 8011               | H. G. Monarch Acid Phos.....                   | Gaddis & Slay Co., Magee.....                                   |
| 8164               | H. G. Monarch Acid Phos.....                   | J. A. Mayfield, Amory.....                                      |
| 8916               | H. G. Monarch Acid Phos.....                   | Gaddis & Slay Co., Magee.....<br>Average.....<br>Guarantee..... |
| 8917               | S. G. Monarch Blood & Bone                     | Parsons, May, Oberschmidt & Co.,<br>Brookhaven .....            |
| 8012               | S. G. Monarch Meal Mixture                     | Gaddis & Slay Co., Magee.....                                   |
| 8165               | S. G. Monarch Meal Mixture                     | J. A. Mayfield, Amory.....                                      |
| 8229               | S. G. Monarch Meal Mixture..                   | J. T. McGraw & Sons, Neshoba.....                               |
| 8918               | S. G. Monarch Meal Mixture..                   | W. G. Peugh, Aberdeen.....                                      |
| 8919               | S. G. Monarch Meal Mixture..                   | Florence Merc. Co., Florence.....                               |
| 8920               | S. G. Monarch Meal Mixture..                   | Hicks Merc. Co., Laurel.....                                    |
| 8921               | S. G. Monarch Meal Mixture..                   | J. A. Mayfield, Amory.....                                      |
| 8922               | S. G. Monarch Meal Mixture..                   | Gaddis & Slay Co., Magee.....<br>Average.....<br>Guarantee..... |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8160               | 10.73              | 9.75                    | 4.58                      | 14.33               | .82                 |                    |                  | \$15.31                 |
| 8910               | 12.81              | 7.19                    | 6.86                      | 14.05               | .81                 |                    |                  | 14.77                   |
|                    |                    | 11.00                   | 3.00                      | 14.00               | 2.00                |                    |                  | 15.10                   |
| 8737               | 13.18              | 7.56                    | 3.31                      | 10.87               | .41                 | 1.09               | 2.89             | 20.40                   |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | .82                | 3.00             | 18.43                   |
| 8911               | 14.26              | 6.86                    | 4.71                      | 11.57               | .36                 | 1.20               | 2.11             | 20.64                   |
| 8912               | 14.60              | 7.62                    | 4.24                      | 11.86               | .37                 | 1.24               | 2.14             | 21.23                   |
|                    |                    | 5.00                    | 3.00                      | 8.00                | 2.00                | 1.65               | 2.00             | 18.20                   |
| 8161               | 9.65               | 7.24                    | 3.09                      | 10.33               | .47                 | 1.77               | 1.83             | 21.27                   |
| 8913               | 12.62              | 7.36                    | 2.76                      | 10.12               | .64                 | 1.37               | 1.86             | 19.49                   |
|                    |                    | 6.50                    | 3.00                      | 9.50                | 2.00                | 1.65               | 1.50             | 19.43                   |
| 8162               | 16.04              | 9.58                    | 3.12                      | 12.70               | 2.25                |                    |                  | 13.66                   |
|                    |                    | 9.00                    | 5.00                      | 14.00               | 2.00                |                    |                  | 14.90                   |
| 8163               | 12.64              | 5.97                    | 1.87                      | 7.84                | 1.48                | 1.54               | 3.16             | 19.02                   |
| 8914               | 14.78              | 6.19                    | 2.39                      | 8.58                | 1.51                | 1.16               | 3.13             | 18.30                   |
|                    |                    | 5.00                    | 3.00                      | 8.00                | 2.00                | 1.64               | 3.00             | 19.31                   |
| 8915               | 9.58               | 5.12                    | 3.29                      | 8.41                | 5.77                | 1.64               | 2.03             | 18.66                   |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 1.00                | 1.65               | 2.00             | 18.30                   |
| 8011               | 12.95              | 10.52                   | 3.93                      | 14.45               | 1.60                |                    |                  | 15.50                   |
| 8164               | 12.64              | 10.17                   | 4.06                      | 14.23               | 1.47                |                    |                  | 15.25                   |
| 8916               | 13.20              | 10.38                   | 3.95                      | 14.33               | 1.93                |                    |                  | 15.37                   |
|                    | 12.93              | 10.35                   | 3.98                      | 14.33               | 1.66                |                    |                  | 15.37                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 8917               | 14.60              | 6.92                    | 4.16                      | 11.08               | 1.74                | 1.34               | 2.14             | 20.70                   |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 2.00                | 1.65               | 2.00             | 20.10                   |
| 8012               | 11.74              | 7.27                    | 3.94                      | 11.21               | .19                 | 1.77               | 1.84             | 22.25                   |
| 8165               | 10.86              | 5.71                    | 4.28                      | 9.99                | 1.11                | 1.78               | 1.65             | 20.58                   |
| 8229               | 11.86              | 7.43                    | 2.52                      | 9.95                | 1.97                | 1.70               | 1.63             | 20.36                   |
| 8918               | 16.72              | 6.49                    | 2.98                      | 9.47                | 1.46                | 1.61               | 1.38             | 19.09                   |
| 8919               | 8.70               | 8.69                    | 3.34                      | 12.03               | 1.15                | 1.45               | 1.59             | 21.73                   |
| 8920               | 11.52              | 7.42                    | 3.21                      | 10.63               | .81                 | 1.64               | 2.16             | 21.48                   |
| 8921               | 12.83              | 6.88                    | 2.67                      | 9.55                | 1.09                | 1.88               | 1.56             | 20.51                   |
| 8922               | 12.01              | 7.25                    | 2.66                      | 9.91                | 1.66                | 1.80               | 1.73             | 20.82                   |
|                    | 12.03              | 7.14                    | 3.20                      | 10.34               | 1.18                | 1.70               | 1.69             | 20.85                   |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 2.00                | 1.65               | 1.50             | 19.53                   |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number.                                           | Name of Brand and Manufacturer.              | Where and from Whom Collected.                                     |
|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|
| 8923                                                         | H. G. Monarch Potash Compound .....          | Florence Merc. Co.; Florence.....<br>Guarantee .....               |
| 8924                                                         | H. G. Simmons & Wright's Cotton Grower ..... | Simmons & Wright, Kewanee.....<br>Guarantee.....                   |
| BROOKHAVEN COTTON OIL & FERTILIZER Co.,<br>Brookhaven, Miss. |                                              |                                                                    |
| 8071                                                         | S. G. Blood & Bone .....                     | S. S. Dale & Son, Prentiss .....                                   |
| 8925                                                         | S. G. Blood and Bone.....                    | Louis Cohn & Bro., Brookhaven.....<br>Guarantee.....               |
| 7963                                                         | S. G. New South .....                        | Brookhaven Cotton Oil & Fertilizer Co., Brookhaven.....            |
| 8026                                                         | S. G. New South .....                        | A. C. Seavy & Sons, Brookhaven.....                                |
| 8072                                                         | S. G. New South .....                        | D. C. Griffith & Co., Silver Creek.....                            |
| 8926                                                         | S. G. New South .....                        | Louis Cohn & Bro., Brookhaven.....                                 |
| 8927                                                         | S. G. New South .....                        | T. J. Reddoch & Co., Bassfield.....                                |
| 8928                                                         | S. G. New South .....                        | O. D. McNease & Co., Carson.....<br>Average.....<br>Guarantee..... |
| CANTON OIL MILL COMPANY,<br>Canton, Miss.                    |                                              |                                                                    |
| 7964                                                         | H. G. Acid Phosphate .....                   | Canton Oil Mill Co., Canton.....                                   |
| 8929                                                         | H. G. Acid Phosphate .....                   | Mullen & Owen, Durant.....<br>Guarantee.....                       |
| 7965                                                         | S. G. Paragon.....                           | Canton Oil Mill Co., Canton.....                                   |
| 8198                                                         | S. G. Paragon.....                           | Oxford Supply Co., Oxford.....                                     |
| 8930                                                         | S. G. Paragon.....                           | Winona Merc. Co., Winona.....<br>Average.....<br>Guarantee.....    |
| CAPITAL FERTILIZER & M'F'G. COMPANY,<br>Jackson, Miss.       |                                              |                                                                    |
| 8044                                                         | H. G. Acid Phosphate .....                   | R. L. Simmons, Newton.....                                         |
| 8931                                                         | H. G. Acid Phosphate .....                   | R. E. Johnson, Canton.....<br>Guarantee.....                       |
| 7935                                                         | S. G. Acid Phosphate .....                   | Philadelphia Merc. Co., Philadelphia....                           |
| 7936                                                         | S. G. Acid Phosphate.....                    | Gallaspy Bros., Union.....                                         |
| 8932                                                         | S. G. Acid Phosphate.....                    | Gallaspy Bros. & Co., Union.....                                   |
| 8933                                                         | S. G. Acid Phosphate.....                    | W. B. Armstrong, Vaiden.....<br>Average.....<br>Guarantee.....     |
| 8230                                                         | S. G. Capital Blood, Bone and Potash .....   | H. M. Dunn, Roxie.....                                             |
| 8934                                                         | S. G. Capital Blood, Bone and Potash .....   | Becker, Lyell & McGrath Co., Wesson<br>Guarantee.....              |
| 7937                                                         | S. G. Cotton Elevator.....                   | W. W. McBeath, Neshoba.....                                        |
| 8045                                                         | S. G. Cotton Elevator.....                   | R. L. Simmons, Newton.....                                         |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8923               | 13.05              | 8.01<br>8.00            | 2.64<br>2.00              | 10.65<br>10.00      | .93<br>2.00         | 1.80<br>1.65       | 3.81<br>3.00     | \$24.10<br>21.85        |
| 8924               | 11.69              | 6.40<br>8.00            | 3.59<br>2.00              | 9.99<br>10.00       | .41<br>2.00         | 2.34<br>2.46       | 3.32<br>3.00     | 24.81<br>25.09          |
| 8071               | 9.98               | 6.55                    | 2.49                      | 9.04                | 1.29                | 1.58               | 1.64             | 18.81                   |
| 8925               | 12.71              | 4.87<br>7.00            | 3.28<br>1.50              | 8.15<br>8.50        | .83<br>1.50         | 1.97<br>1.65       | 2.11<br>2.00     | 19.76<br>18.95          |
| 7963               | 9.98               | 4.76                    | 3.64                      | 8.40                | .37                 | 1.78               | 2.42             | 19.62                   |
| 8026               | 9.92               | 4.71                    | 4.22                      | 8.93                | .05                 | 1.79               | 2.26             | 20.05                   |
| 8072               | 9.53               | 4.75                    | 4.07                      | 8.82                | .47                 | 1.74               | 2.14             | 19.60                   |
| 8926               | 12.49              | 5.85                    | 2.65                      | 8.50                | .36                 | 1.87               | 2.55             | 20.35                   |
| 8927               | 10.36              | 4.77                    | 3.36                      | 8.13                | .65                 | 1.87               | 2.63             | 20.02                   |
| 8928               | 10.11              | 5.27                    | 3.12                      | 8.39                | .13                 | 1.73               | 2.37             | 19.40                   |
|                    | <b>10.40</b>       | <b>5.02</b>             | <b>3.51</b>               | <b>8.53</b>         | <b>.34</b>          | <b>1.80</b>        | <b>2.40</b>      | <b>19.84</b>            |
|                    |                    | 6.30                    | 2.00                      | 8.30                | 1.00                | 1.85               | 2.00             | 19.46                   |
| 7964               | 16.15              | 10.52                   | 4.60                      | 15.12               | 1.20                |                    |                  | 16.17                   |
| 8929               | 16.39              | 9.66<br>11.00           | 5.96<br>4.00              | 15.62<br>15.00      | .51<br>1.00         |                    |                  | 16.59<br>16.10          |
| 7965               | 8.89               | 8.41                    | 3.56                      | 11.97               | .26                 | 2.41               | .70              | 24.45                   |
| 8198               | 11.21              | 7.10                    | 3.91                      | 11.01               | .87                 | 2.26               | .55              | 22.49                   |
| 8930               | 10.95              | 7.79                    | 3.64                      | 11.43               | .59                 | 1.99               | .64              | 22.05                   |
|                    | <b>10.35</b>       | <b>7.77</b>             | <b>3.70</b>               | <b>11.47</b>        | <b>.57</b>          | <b>2.22</b>        | <b>.63</b>       | <b>22.99</b>            |
|                    |                    | 6.00                    | 4.00                      | 10.00               | 1.05                | 2.00               | .50              | 20.18                   |
| 8044               | 12.33              | 8.87                    | 4.89                      | 13.76               | .26                 |                    |                  | 14.65                   |
| 8931               | 12.54              | 8.42<br>10.00           | 4.48<br>4.00              | 12.90<br>14.00      | .50<br>1.00         |                    |                  | 13.74<br>15.00          |
| 7935               | 14.20              | 9.83                    | 4.14                      | 13.97               | .42                 |                    |                  | 14.95                   |
| 7936               | 11.53              | 7.62                    | 4.01                      | 11.63               | .36                 |                    |                  | 12.39                   |
| 8932               | 12.08              | 7.80                    | 4.61                      | 12.41               | .22                 |                    |                  | 13.19                   |
| 8933               | 13.82              | 7.78                    | 5.28                      | 13.06               | .08                 |                    |                  | 13.84                   |
|                    | <b>12.91</b>       | <b>8.26</b>             | <b>4.51</b>               | <b>12.77</b>        | <b>.27</b>          |                    |                  | <b>13.59</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 1.00                |                    |                  | 13.00                   |
| 8230               | 12.24              | 7.65                    | 1.62                      | 9.27                | .18                 | 1.53               | 1.71             | 19.05                   |
| 8934               | 11.13              | 6.42<br>6.50            | 2.36<br>1.50              | 8.78<br>8.00        | .18<br>1.00         | 2.12<br>1.65       | 2.77<br>2.00     | 21.97<br>18.35          |
| 7937               | 11.73              | 7.67                    | 2.37                      | 10.04               | .38                 | 1.53               | 2.16             | 20.42                   |
| 8045               | 10.24              | 6.28                    | 3.41                      | 9.69                | .33                 | 1.53               | 2.31             | 20.06                   |



| Laboratory Number. | Name of Brand and Manufacturer.                                                | Where and from Whom Collected.                          |
|--------------------|--------------------------------------------------------------------------------|---------------------------------------------------------|
| 8935               | S. G. Cotton Elevator.....                                                     | M. E. Phillips, Maben.....                              |
| 8936               | S. G. Cotton Elevator.....                                                     | Guin, McDonald Co., Tylertown.....                      |
|                    |                                                                                | Average.....                                            |
|                    |                                                                                | Guarantee.....                                          |
| 7938               | S. G. Nonpariel.....                                                           | Philadelphia Merc. Co., Philadelphia                    |
| 7939               | S. G. Nonpariel.....                                                           | Gallaspy Bros., Union.....                              |
| 7940               | S. G. Nonpariel.....                                                           | J. T. Lewis, Neshoba.....                               |
| 8073               | S. G. Nonpariel.....                                                           | W. C. Ellis Merc. Co., Magee.....                       |
| 8197               | S. G. Nonpariel.....                                                           | W. B. Armstrong, Vaiden.....                            |
| 8231               | S. G. Nonpariel.....                                                           | J. E. Cobb & Son, Weir.....                             |
| 8937               | S. G. Nonpariel.....                                                           | Mills-Guy Co., McComb City.....                         |
| 8938               | S. G. Nonpariel.....                                                           | Hyman Merc. Co., Summit.....                            |
| 8939               | S. G. Nonpariel.....                                                           | Latimer & Harris, Utica.....                            |
| 8940               | S. G. Nonpariel.....                                                           | Ross Bros. & Summer, Pelahatchie....                    |
| 8941               | S. G. Nonpariel.....                                                           | A. H. Martin, Florence.....                             |
| 8942               | S. G. Nonpariel.....                                                           | S. S. Dale & Sons, Prentiss.....                        |
|                    |                                                                                | Average.....                                            |
|                    |                                                                                | Guarantee.....                                          |
| 7941               | S. G. Red Star Brand.....                                                      | Philadelphia Merc. Co., Philadelphia....                |
| 8232               | S. G. Red Star Brand.....                                                      | Harris Brantly, Neshoba.....                            |
|                    |                                                                                | Guarantee.....                                          |
| 8013               | H. G. Vegetable Grower.....                                                    | J. D. Ray, Kosciusko.....                               |
| 8943               | H. G. Vegetable Grower.....                                                    | Miss. Cotton Oil Co., West Point.....                   |
|                    |                                                                                | Guarantee.....                                          |
| 8233               | S. G. German Kainit.....                                                       | Brandon Merc. Co., Brandon.....                         |
| 8944               | S. G. German Kainit.....                                                       | Canton Gin Co., Canton.....                             |
| 8945               | S. G. German Kainit.....                                                       | J. B. Mitchel, Ackerman.....                            |
|                    |                                                                                | Average.....                                            |
|                    |                                                                                | Guarantee.....                                          |
|                    | CLINTON COTTON OIL & M'F'G.<br>COMPANY,<br>Clinton, La.                        |                                                         |
| 8946               | S. G. Acid Phosphate.....                                                      | McClain & Ratcliff, Gloster.....                        |
|                    |                                                                                | Guarantee.....                                          |
| 8234               | S. G. Comcos.....                                                              | Strahan Bros. & Co., Hamburg.....                       |
| 8947               | S. G. Comcos.....                                                              | M. P. Dixon, Centreville.....                           |
| 8948               | S. G. Comcos.....                                                              | McClain & Ratcliff, Gloster.....                        |
|                    |                                                                                | Average.....                                            |
|                    |                                                                                | Guarantee.....                                          |
|                    | CRYSTAL SPRINGS OIL MILL,<br>FERT. & M'F'G. COMPANY,<br>Crystal Springs, Miss. |                                                         |
| 8027               | H. G. Acid Phosphate.....                                                      | Lotterhos & Huber Co., Crystal Sp'gs.<br>Guarantee..... |
| 8028               | S. G. Crystal Star.....                                                        | Lotterhos & Huber Co., Crystal Sp'gs.                   |
| 8949               | S. G. Crystal Star.....                                                        | Lotterhos & Huber Co., Crystal Sp'gs.                   |
| 8950               | S. G. Crystal Star.....                                                        | Allford & Miller, Gallman.....                          |
|                    |                                                                                | Average.....                                            |
|                    |                                                                                | Guarantee.....                                          |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8935               | 12.34              | 6.63                    | 3.59                      | 10.22               | .22                 | 1.68               | 1.89             | \$20.80                 |
| 8936               | 11.79              | 6.40                    | 2.93                      | 9.33                | .12                 | 1.67               | 2.29             | 20.22                   |
|                    | <b>11.53</b>       | <b>6.75</b>             | <b>3.07</b>               | <b>9.82</b>         | <b>.26</b>          | <b>1.60</b>        | <b>2.17</b>      | <b>20.37</b>            |
|                    |                    | <i>6.50</i>             | <i>1.50</i>               | <i>8.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.35</i>            |
| 7938               | 10.88              | 7.57                    | 1.76                      | 9.33                | .23                 | 1.67               | 2.29             | 20.33                   |
| 7939               | 11.45              | 6.55                    | 2.75                      | 9.30                | .32                 | 1.67               | 2.40             | 20.33                   |
| 7940               | 11.44              | 6.72                    | 2.95                      | 9.67                | .37                 | 1.54               | 2.34             | 20.16                   |
| 8073               | 11.19              | 6.13                    | 3.35                      | 9.48                | .33                 | 1.61               | 2.40             | 20.24                   |
| 8197               | 12.35              | 5.51                    | 3.42                      | 8.93                | .19                 | 1.72               | 2.37             | 19.98                   |
| 8231               | 13.59              | 6.47                    | 2.27                      | 8.74                | .27                 | 1.76               | 2.61             | 20.30                   |
| 8937               | 12.04              | 6.78                    | 1.94                      | 8.72                | .40                 | 1.78               | 2.02             | 19.71                   |
| 8938               | 12.31              | 6.06                    | 3.63                      | 9.69                | .20                 | 1.49               | 2.00             | 19.53                   |
| 8939               | 9.38               | 6.18                    | 3.02                      | 9.20                | .23                 | 1.82               | 2.34             | 20.71                   |
| 8940               | 11.98              | 6.46                    | 2.69                      | 9.15                | .33                 | 1.69               | 2.25             | 20.06                   |
| 8941               | 8.49               | 6.54                    | 1.81                      | 8.35                | .23                 | 1.71               | 1.88             | 18.84                   |
| 8942               | 12.11              | 6.35                    | 3.03                      | 9.38                | .37                 | 1.66               | 2.25             | 20.18                   |
|                    | <b>11.43</b>       | <b>6.44</b>             | <b>2.72</b>               | <b>9.16</b>         | <b>.29</b>          | <b>1.68</b>        | <b>2.27</b>      | <b>20.04</b>            |
|                    |                    | <i>6.50</i>             | <i>1.50</i>               | <i>8.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.35</i>            |
| 7941               | 10.98              | 7.45                    | 1.95                      | 9.40                | .09                 | 1.72               | 2.30             | 20.61                   |
| 8232               | 11.79              | 5.63                    | 3.40                      | 9.03                | .17                 | 1.93               | 2.53             | 21.13                   |
|                    |                    | <i>6.50</i>             | <i>1.50</i>               | <i>8.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.35</i>            |
| 8013               | 10.10              | 5.45                    | 2.51                      | 7.96                | .17                 | 2.50               | 3.74             | 23.60                   |
| 8943               | 9.93               | 4.76                    | 2.63                      | 7.39                | .12                 | 2.58               | 4.97             | 24.64                   |
|                    |                    | <i>5.00</i>             | <i>2.00</i>               | <i>7.00</i>         | <i>1.00</i>         | <i>2.50</i>        | <i>4.00</i>      | <i>22.80</i>            |
| 8233               | 4.13               |                         |                           |                     |                     |                    | 12.64            | 14.54                   |
| 8944               | 1.13               |                         |                           |                     |                     |                    | 12.72            | 14.63                   |
| 8945               | 1.07               |                         |                           |                     |                     |                    | 13.02            | 14.97                   |
|                    | <b>2.11</b>        |                         |                           |                     |                     |                    | <b>12.79</b>     | <b>14.71</b>            |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |
| 8946               | 16.51              | 10.57                   | 2.87                      | 13.44               | 2.58                |                    |                  | 14.50                   |
|                    |                    | <i>10.00</i>            | <i>2.00</i>               | <i>12.00</i>        | <i>2.00</i>         |                    |                  | <i>13.00</i>            |
| 8234               | 11.91              | 6.24                    | 2.79                      | 9.03                | 1.02                | 1.85               | 2.36             | 20.67                   |
| 8947               | 12.70              | 6.06                    | 2.39                      | 8.45                | 1.23                | 1.78               | 2.23             | 19.59                   |
| 8948               | 14.03              | 6.22                    | 2.83                      | 9.05                | 1.04                | 1.60               | 2.02             | 19.30                   |
|                    | <b>12.88</b>       | <b>6.17</b>             | <b>2.67</b>               | <b>8.84</b>         | <b>1.09</b>         | <b>1.74</b>        | <b>2.20</b>      | <b>19.85</b>            |
|                    |                    | <i>6.00</i>             | <i>2.00</i>               | <i>8.00</i>         | <i>.05</i>          | <i>1.65</i>        | <i>2.00</i>      | <i>18.80</i>            |
| 8027               | 16.57              | 9.88                    | 4.72                      | 14.60               | 2.02                |                    |                  | 15.59                   |
|                    |                    | <i>10.00</i>            | <i>5.00</i>               | <i>15.00</i>        | <i>1.00</i>         |                    |                  | <i>16.00</i>            |
| 8028               | 10.39              | 5.35                    | 2.96                      | 8.31                | 1.15                | 1.73               | 2.59             | 19.57                   |
| 8949               | 11.38              | 5.12                    | 3.15                      | 8.27                | 1.01                | 1.67               | 2.25             | 18.88                   |
| 8950               | 11.60              | 4.95                    | 2.84                      | 7.79                | 1.16                | 1.71               | 2.24             | 18.48                   |
|                    | <b>11.12</b>       | <b>5.14</b>             | <b>2.99</b>               | <b>8.13</b>         | <b>1.10</b>         | <b>1.70</b>        | <b>2.36</b>      | <b>18.97</b>            |
|                    |                    | <i>5.50</i>             | <i>2.50</i>               | <i>8.00</i>         | <i>.75</i>          | <i>1.70</i>        | <i>2.00</i>      | <i>18.45</i>            |

| Laboratory Number. | Name of Brand and Manufacturer.                     | Where and from Whom Collected.        |
|--------------------|-----------------------------------------------------|---------------------------------------|
| 8029               | S. G. L. & H.'s Cotton Fert.                        | Lotterhos & Huber Co., Crystal Sp'gs. |
| 8951               | S. G. L. & H.'s Cotton Fert.                        | Allford & Miller, Gallman.....        |
| 8952               | S. G. L. & H.'s Cotton Fert.                        | Lotterhos & Huber Co., Crystal Sp'gs. |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |
| 8030               | H. G. L. & H.'s Vegetable<br>Grower .....           | Lotterhos & Huber Co., Crystal Sp'gs. |
|                    |                                                     | Guarantee.....                        |
| 8031               | S. G. German Kainit.....                            | Lotterhos & Huber Co., Crystal Sp'gs. |
|                    |                                                     | Guarantee.....                        |
|                    | EAGLE COTTON OIL Co.,<br>Meridian, Miss.            |                                       |
| 7966               | Eagle H. G. Acid Phosphate                          | W. H. Joyner, Forest.....             |
| 8046               | Eagle H. G. Acid Phosphate                          | H. N. Stuart, Morton.....             |
| 8953               | Eagle H. G. Acid Phosphate                          | Davis & Bufkin, Buckatunna .....      |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |
| 7967               | S. G. Farm Mixture .....                            | W. H. Joyner, Forest.....             |
| 8047               | S. G. Farm Mixture .....                            | H. N. Stuart, Morton .....            |
| 8954               | S. G. Farm Mixture .....                            | Joe Cramer, Scooba.....               |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |
| 8115               | S. G. German Kainit.....                            | C. T. Bonney, Enterprise.....         |
| 8955               | S. G. German Kainit.....                            | W. H. Joyner, Forest.....             |
|                    |                                                     | Guarantee.....                        |
|                    | FEDERAL CHEMICAL COMPANY<br>Louisville, Ky.         |                                       |
| 8199               | Daybreak Pure H. G. Acid<br>Phosphate.....          | R. J. Burnett, Bay Springs.....       |
| 8956               | Daybreak Pure H. G. Acid<br>Phosphate.....          | J. A. Goree, Columbus.....            |
|                    |                                                     | Guarantee.....                        |
| 8200               | Daybreak S. G. Acid Phos-<br>phate with Potash..... | R. J. Burnett, Bay Springs.....       |
|                    |                                                     | Guarantee.....                        |
| 8957               | Daybreak S. G. Red Rooster<br>Fertilizer.....       | Young & Morrow, Winona.....           |
| 8958               | Daybreak S. G. Red Rooster<br>Fertilizer.....       | Winner, Klein & Co., Meridian.....    |
|                    |                                                     | Guarantee.....                        |
| 8959               | S. G. The Complete Fertilizer                       | Sloan & Co., Baldwyn.....             |
| 8960               | S. G. The Complete Fertilizer                       | Seward & Co., Ackerman.....           |
|                    |                                                     | Guarantee.....                        |
|                    | FLORENCE COTTON OIL Co.,<br>Florence, Ala.          |                                       |
| 8961               | S. G. Liberty C. S. Meal<br>and Bone.....           | Cochran-Acker & Co., Guntown.....     |
|                    |                                                     | Guarantee.....                        |
| 8962               | S. G. German Kainit.....                            | Cochran-Acker & Co., Guntown.....     |
|                    |                                                     | Guarantee.....                        |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8029               | 11.06              | 5.32                    | 3.06                      | 8.38                | 1.10                | 1.51               | 3.02             | \$19.26                 |
| 8951               | 11.79              | 5.32                    | 2.85                      | 8.17                | 1.05                | 1.64               | 2.37             | 18.80                   |
| 8952               | 11.86              | 4.59                    | 3.14                      | 7.73                | .91                 | 1.63               | 2.26             | 18.08                   |
|                    | <b>11.57</b>       | <b>5.08</b>             | <b>3.02</b>               | <b>8.10</b>         | <b>1.02</b>         | <b>1.59</b>        | <b>2.55</b>      | <b>18.71</b>            |
|                    |                    | <i>5.50</i>             | <i>2.50</i>               | <i>8.00</i>         | <i>.75</i>          | <i>1.70</i>        | <i>2.00</i>      | <i>18.45</i>            |
| 8030               | 10.19              | 3.94                    | 2.90                      | 6.84                | 1.00                | 2.88               | 4.53             | 24.65                   |
|                    |                    | <i>4.00</i>             | <i>1.50</i>               | <i>5.50</i>         | <i>.25</i>          | <i>3.00</i>        | <i>4.00</i>      | <i>23.05</i>            |
| 8031               | 3.18               |                         |                           |                     |                     |                    | 12.36            | 14.21                   |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |
| 7966               | 19.57              | 11.51                   | 2.66                      | 14.17               | 1.47                |                    |                  | 15.32                   |
| 8046               | 14.12              | 10.14                   | 2.94                      | 13.08               | 2.23                |                    |                  | 14.09                   |
| 8953               | 14.25              | 9.57                    | 4.60                      | 14.17               | 1.52                |                    |                  | 15.13                   |
|                    | <b>15.98</b>       | <b>10.41</b>            | <b>3.40</b>               | <b>13.81</b>        | <b>1.41</b>         |                    |                  | <b>14.85</b>            |
|                    |                    | <i>10.00</i>            | <i>4.00</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>15.00</i>            |
| 7967               | 12.02              | 6.09                    | 3.21                      | 9.30                | .73                 | 1.44               | 2.23             | 19.16                   |
| 8047               | 11.23              | 6.19                    | 3.37                      | 9.56                | .63                 | 1.70               | 2.11             | 20.36                   |
| 8954               | 11.90              | 5.88                    | 2.89                      | 8.77                | .56                 | 1.55               | 2.32             | 19.10                   |
|                    | <b>11.72</b>       | <b>6.05</b>             | <b>3.16</b>               | <b>9.21</b>         | <b>.64</b>          | <b>1.56</b>        | <b>2.22</b>      | <b>19.54</b>            |
|                    |                    | <i>6.00</i>             | <i>2.00</i>               | <i>8.00</i>         | <i>.50</i>          | <i>1.65</i>        | <i>2.00</i>      | <i>18.30</i>            |
| 8115               | 1.88               |                         |                           |                     |                     |                    | 11.70            | 13.46                   |
| 8955               | 1.51               |                         |                           |                     |                     |                    | 12.72            | 14.63                   |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |
| 8199               | 10.25              | 8.99                    | 5.25                      | 14.24               | .49                 |                    |                  | 15.14                   |
| 8956               | 10.72              | 8.34                    | 7.48                      | 15.82               | .58                 |                    |                  | 16.65                   |
|                    |                    | <i>9.33</i>             | <i>4.67</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>14.93</i>            |
| 8200               | 9.48               | 5.96                    | 4.75                      | 10.71               | .42                 |                    | 1.83             | 14.48                   |
|                    |                    | <i>6.67</i>             | <i>3.33</i>               | <i>10.00</i>        | <i>1.00</i>         |                    | <i>2.00</i>      | <i>13.97</i>            |
| 8957               | 8.42               | 6.18                    | 3.73                      | 9.91                | 2.47                | 2.13               | 1.52             | 21.79                   |
| 8958               | 7.41               | 6.58                    | 3.45                      | 10.03               | 2.39                | 1.85               | 2.11             | 21.52                   |
|                    |                    | <i>6.67</i>             | <i>3.33</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>        | <i>1.50</i>      | <i>19.99</i>            |
| 8959               | 6.65               | 5.45                    | 3.52                      | 8.97                | 2.55                | 1.53               | 1.89             | 18.71                   |
| 8960               | 8.39               | 5.73                    | 3.73                      | 9.46                | 1.55                | 1.74               | 2.09             | 20.34                   |
|                    |                    | <i>5.33</i>             | <i>2.67</i>               | <i>8.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.23</i>            |
| 8961               | 14.28              | 6.41                    | 4.32                      | 10.73               | .77                 | 1.39               | 2.71             | 21.12                   |
|                    |                    | <i>6.00</i>             | <i>2.00</i>               | <i>8.00</i>         | <i>2.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.30</i>            |
| 8962               | 1.80               |                         |                           |                     |                     |                    | 13.14            | 15.11                   |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |



| Laboratory Number. | Name of Brand and Manufacturer.                               | Where and from Whom Collected.                                |
|--------------------|---------------------------------------------------------------|---------------------------------------------------------------|
|                    | GREAT SOUTHERN PHOSPHATE COMPANY,<br>Mt. Pleasant, Tenn.      |                                                               |
| 8327               | H. G. Acid Phosphate .....                                    | J. W. Cooper, New Hope.....<br>Guarantee.....                 |
| 8235               | Great Southern Special H. G. Acid Phosphate .....             | Farmers Union, Forest.....                                    |
| 8325               | Great Southern Special H. G. Acid Phosphate .....             | W. H. Kolb, Aberdeen .....                                    |
| 8326               | Great Southern Special H. G. Acid Phosphate .....             | J. W. Cooper, New Hope.....<br>Average.....<br>Guarantee..... |
| 8236               | H. G. Best by Test .....                                      | Farmers Union Warehouse Co.,<br>Monticello.....               |
| 8328               | H. G. Best by Test .....                                      | W. H. Kolb, Aberdeen.....                                     |
| 8963               | H. G. Best by Test .....                                      | Farmers Union, Magee.....<br>Average.....<br>Guarantee.....   |
| 8964               | O. G. The Planters Champion                                   | Farmers Union Warehouse Co., Carson                           |
| 8965               | O. G. The Planters Champion                                   | Farmers Union, Seminary.....<br>Guarantee.....                |
| 8237               | S. G. Universal Cot. Grower                                   | Farmers Union, Forest.....                                    |
| 8966               | S. G. Universal Cot. Grower                                   | Farmers Union, Heidelberg.....<br>Guarantee.....              |
| 8116               | S. G. German Kainit.....                                      | Farmers Union Warehouse Co., Carson                           |
| 8329               | S. G. German Kainit.....                                      | J. W. Cooper, New Hope.....<br>Guarantee.....                 |
|                    | GULFPORT COTTON OIL, FERT.<br>& M'FG. Co.,<br>Gulfport, Miss. |                                                               |
| 8238               | Primo H. G. Acid Phosphate<br>16%.....                        | J. T. King, Summit.....                                       |
| 8967               | Primo H. G. Acid Phosphate<br>16%.....                        | J. L. Moyse & Bro., Summit.....<br>Guarantee.....             |
| 8968               | Primo H. G. Acid Phosphate<br>14%.....                        | J. L. Wilson, Braxton.....                                    |
| 8969               | Primo H. G. Acid Phosphate<br>14%.....                        | Hyman Merc. Co., Summit.....<br>Guarantee.....                |
| 8970               | Primo S. G. Acid Phosphate                                    | Boswell Bros., Weathersby.....                                |
| 8971               | Primo S. G. Acid Phosphate                                    | J. L. Wilson, Braxton.....<br>Guarantee.....                  |
| 8074               | Primo S. G. C. S. Meal<br>Compound .....                      | S. S. Dale & Sons, Prentiss .....                             |
| 8075               | Primo S. G. C. S. Meal<br>Compound .....                      | J. D. Smith & Co., Prentiss.....                              |
| 8117               | Primo S. G. C. S. Meal<br>Compound .....                      | W. J. Carter, Bassfield.....                                  |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                       |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|-----------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent.   | Insoluble Per Cent. |                    |                  |                         |
| 8327               | 13.85              | 10.17<br><i>12.00</i>   | 3.74<br><i>2.00</i>       | 13.91<br><i>14.00</i> | 2.48<br><i>2.00</i> |                    |                  | \$14.93<br><i>15.20</i> |
| 8235               | 14.17              | 14.33                   | 2.61                      | 16.94                 | .58                 |                    |                  | 18.37                   |
| 8325               | 15.49              | 13.02                   | 2.82                      | 15.84                 | 1.15                |                    |                  | 17.14                   |
| 8326               | 14.52              | 13.69                   | 2.59                      | 16.28                 | .79                 |                    |                  | 17.65                   |
|                    | <b>14.73</b>       | <b>13.68</b>            | <b>2.67</b>               | <b>16.35</b>          | <b>.84</b>          |                    |                  | <b>17.72</b>            |
|                    |                    | <i>14.00</i>            | <i>2.00</i>               | <i>16.00</i>          | <i>2.00</i>         |                    |                  | <i>17.40</i>            |
| 8236               | 11.82              | 7.37                    | 3.45                      | 10.82                 | 3.43                | 1.73               | 2.10             | 21.97                   |
| 8328               | 11.70              | 6.51                    | 4.09                      | 10.60                 | 2.14                | 1.63               | 2.11             | 21.26                   |
| 8963               | 11.61              | 6.49                    | 5.97                      | 12.46                 | 1.60                | 1.66               | 2.73             | 24.13                   |
|                    | <b>11.71</b>       | <b>6.79</b>             | <b>4.50</b>               | <b>11.29</b>          | <b>2.39</b>         | <b>1.67</b>        | <b>2.32</b>      | <b>22.45</b>            |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>          | <i>5.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>20.60</i>            |
| 8964               | 11.77              | 5.28                    | 4.75                      | 10.03                 | 4.66                | .85                | 1.10             | 16.23                   |
| 8965               | 11.47              | 5.13                    | 4.87                      | 10.00                 | 4.38                | 1.12               | 1.33             | 17.52                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>          | <i>5.00</i>         | <i>.82</i>         | <i>1.00</i>      | <i>16.13</i>            |
| 8237               | 10.70              | 5.26                    | 2.94                      | 8.20                  | 5.48                | 1.65               | 1.97             | 18.41                   |
| 8966               | 11.75              | 5.09                    | 3.49                      | 8.58                  | 2.87                | 1.66               | 1.82             | 18.68                   |
|                    |                    | <i>6.00</i>             | <i>2.00</i>               | <i>8.00</i>           | <i>5.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.30</i>            |
| 8116               | 1.29               |                         |                           |                       |                     |                    | 11.90            | 13.69                   |
| 8329               | 2.34               |                         |                           |                       |                     |                    | 10.58            | 12.17                   |
|                    |                    |                         |                           |                       |                     |                    | <i>12.40</i>     | <i>14.26</i>            |
| 8238               | 14.11              | 12.10                   | 3.76                      | 15.86                 | 1.38                |                    |                  | 17.07                   |
| 8967               | 14.81              | 12.10<br><i>14.00</i>   | 4.85<br><i>2.00</i>       | 16.95<br><i>16.00</i> | .42<br><i>1.00</i>  |                    |                  | 18.16<br><i>17.40</i>   |
| 8968               | 15.99              | 9.88                    | 5.20                      | 15.08                 | .59                 |                    |                  | 16.07                   |
| 8969               | 12.65              | 10.22<br><i>12.00</i>   | 5.79<br><i>2.00</i>       | 16.01<br><i>14.00</i> | .40<br><i>1.00</i>  |                    |                  | 17.03<br><i>15.20</i>   |
| 8970               | 11.25              | 9.12                    | 4.04                      | 13.16                 | .65                 |                    |                  | 14.07                   |
| 8971               | 15.75              | 10.27<br><i>10.00</i>   | 4.36<br><i>2.00</i>       | 14.63<br><i>12.00</i> | 1.18<br><i>1.00</i> |                    |                  | 15.66<br><i>13.00</i>   |
| 8074               | 12.74              | 8.60                    | 2.88                      | 11.48                 | 1.15                | 1.79               | 2.59             | 23.63                   |
| 8075               | 11.92              | 7.60                    | 2.97                      | 10.57                 | 1.07                | 1.78               | 2.38             | 22.24                   |
| 8117               | 13.95              | 8.41                    | 3.01                      | 11.42                 | 1.38                | 1.89               | 2.50             | 23.84                   |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                                     |
|--------------------|---------------------------------------------------------|--------------------------------------------------------------------|
| 8201               | Primo S. G. C. S. Meal Compound .....                   | Max Priebatch, Brookhaven.....                                     |
| 8239               | Primo S. G. C. S. Meal Compound .....                   | C. Atkinson's Sons Co., Summit.....                                |
| 8972               | Primo S. G. C. S. Meal Compound .....                   | Wesson & Stovall, Saltillo .....                                   |
| 8973               | Primo S. G. C. S. Meal Compound .....                   | Ruffin Merc. Co., Ellisville.....                                  |
| 8974               | Primo S. G. C. S. Meal Compound .....                   | John McGrath & Sons, Brookhaven....                                |
| 8975               | Primo S. G. C. S. Meal Compound .....                   | W. L. Martin, Florence.....<br>Average.....<br>Guarantee.....      |
| 8076               | Primo S. G. R. B. Super-phosphate .....                 | J. D. Smith & Co., Prentiss.....                                   |
| 8118               | Primo S. G. R. B. Super-phosphate .....                 | T. J. Reddoch & Co., Bassfield.....                                |
| 8976               | Primo S. G. R. B. Super-phosphate .....                 | M. Oates, Bay Springs.....                                         |
| 8977               | Primo S. G. R. B. Super-phosphate .....                 | John McGrath & Sons, Brookhaven....                                |
| 8978               | Primo S. G. R. B. Super-phosphate .....                 | C. Atkinson's Sons Co., Summit.....                                |
| 8979               | Primo S. G. R. B. Super-phosphate .....                 | F. E. Shivers, D'Lo.....<br>Average.....<br>Guarantee.....         |
| 8980               | S. G. German Kainit.....                                | J. L. Moyse & Bro., Summit.....<br>Guarantee.....                  |
|                    | HAZLEHURST OIL MILL & FERTILIZER Co., Hazlehurst, Miss. |                                                                    |
| 8032               | H. G. Acid Phosphate .....                              | J. R. Gallaspy, Crystal Springs.....                               |
| 8240               | H. G. Acid Phosphate .....                              | G. W. Gordon, Pickens.....<br>Guarantee.....                       |
| 7968               | S. G. Imperial Fertilizer.....                          | Hazlehurst Oil Mill & Fert. Co., H'hurst                           |
| 7969               | S. G. Imperial Fertilizer.....                          | Hazlehurst Oil Mill & Fert. Co., H'hurst                           |
| 8033               | S. G. Imperial Fertilizer.....                          | J. R. Gallaspy, Crystal Springs.....                               |
| 8241               | S. G. Imperial Fertilizer.....                          | G. W. Gordon, Pickens.....                                         |
| 8981               | S. G. Imperial Fertilizer.....                          | Mutual Merc. Co., Utica.....                                       |
| 8982               | S. G. Imperial Fertilizer.....                          | W. L. Robinson Co., Liberty.....<br>Average.....<br>Guarantee..... |
| 7970               | H. G. Imperial Veg. Grower .....                        | Hazlehurst Oil Mill & Fert. Co., H'hurst<br>Guarantee.....         |
| 8034               | S. G. German Kainit.....                                | J. R. Gallaspy, Crystal Springs.....<br>Guarantee.....             |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8201               | 13.17              | 7.48                    | 2.17                      | 9.65                | .83                 | 1.79               | 2.67             | \$21.59                 |
| 8239               | 13.07              | 7.70                    | 3.15                      | 10.85               | .50                 | 2.20               | 2.40             | 24.27                   |
| 8972               | 17.36              | 6.68                    | 3.97                      | 10.65               | .20                 | 1.29               | 1.81             | 19.62                   |
| 8973               | 16.05              | 7.22                    | 4.06                      | 11.28               | .64                 | 1.90               | 2.13             | 23.18                   |
| 8974               | 13.61              | 6.52                    | 3.71                      | 10.23               | .29                 | 1.67               | 2.73             | 21.72                   |
| 8975               | 14.88              | 6.28                    | 3.39                      | 9.67                | .41                 | 1.56               | 2.57             | 20.46                   |
|                    | <b>14.08</b>       | <b>7.39</b>             | <b>3.26</b>               | <b>10.65</b>        | <b>.72</b>          | <b>1.76</b>        | <b>2.42</b>      | <b>22.28</b>            |
|                    |                    | <i>7.00</i>             | <i>2.00</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>19.50</i>            |
| 8076               | 12.23              | 6.77                    | 2.73                      | 9.50                | .93                 | 1.80               | 2.65             | 21.37                   |
| 8118               | 12.83              | 7.06                    | 2.25                      | 9.31                | 1.02                | 1.94               | 2.92             | 22.07                   |
| 8976               | 13.37              | 4.98                    | 3.24                      | 8.22                | .40                 | 1.92               | 2.29             | 19.85                   |
| 8977               | 14.78              | 6.67                    | 3.77                      | 10.44               | .36                 | 1.57               | 2.46             | 21.26                   |
| 8978               | 15.26              | 6.97                    | 3.06                      | 10.03               | .19                 | 2.03               | 2.06             | 22.22                   |
| 8979               | 13.22              | 6.26                    | 3.88                      | 10.14               | .35                 | 2.00               | 2.54             | 22.70                   |
|                    | <b>13.61</b>       | <b>6.45</b>             | <b>3.15</b>               | <b>9.60</b>         | <b>.54</b>          | <b>1.88</b>        | <b>2.48</b>      | <b>21.58</b>            |
|                    |                    | <i>7.00</i>             | <i>2.00</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>19.50</i>            |
| 8980               | 3.20               |                         |                           |                     |                     |                    | 12.16            | 13.98                   |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |
| 8032               | 18.02              | 11.80                   | 2.81                      | 14.61               | 1.28                |                    |                  | 15.79                   |
| 8240               | 17.56              | 10.46                   | 3.44                      | 13.90               | 1.39                |                    |                  | 14.95                   |
|                    |                    | <i>12.00</i>            | <i>2.00</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>15.20</i>            |
| 7968               | 11.46              | 6.72                    | 2.29                      | 9.01                | 1.74                | 1.64               | 2.33             | 19.82                   |
| 7969               | 12.94              | 7.16                    | 1.88                      | 9.04                | 1.37                | 1.44               | 2.17             | 18.91                   |
| 8033               | 12.55              | 7.20                    | 2.53                      | 9.73                | 1.00                | 1.57               | 2.31             | 20.36                   |
| 8241               | 13.67              | 7.02                    | 2.62                      | 9.64                | 1.36                | 1.82               | 2.07             | 20.97                   |
| 8981               | 13.06              | 6.97                    | 2.60                      | 9.57                | 1.47                | 1.64               | 1.81             | 19.87                   |
| 8982               | 10.02              | 5.08                    | 4.30                      | 9.38                | .29                 | 1.97               | 1.82             | 20.80                   |
|                    | <b>12.28</b>       | <b>6.69</b>             | <b>2.70</b>               | <b>9.39</b>         | <b>1.20</b>         | <b>1.68</b>        | <b>2.09</b>      | <b>20.12</b>            |
|                    |                    | <i>7.00</i>             | <i>2.00</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>1.75</i>      | <i>19.21</i>            |
| 7970               | 9.11               | 4.57                    | 2.34                      | 6.91                | 1.14                | 3.35               | 2.41             | 24.23                   |
|                    |                    | <i>4.00</i>             | <i>1.50</i>               | <i>5.50</i>         | <i>1.00</i>         | <i>3.00</i>        | <i>2.00</i>      | <i>20.75</i>            |
| 8034               | 3.09               |                         |                           |                     |                     |                    | 12.66            | 14.56                   |
|                    |                    |                         |                           |                     |                     |                    | <i>12.00</i>     | <i>13.80</i>            |



TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                                                    | Where and from Whom Collected.                                     |
|--------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| 8983               | INDEPENDENT OIL & FERT. WORKS,<br>Columbus, Miss.<br>S. G. Independent All Cotton Fertilizer ..... | A. J. Sanders, Steens.....<br>Guarantee.....                       |
| 8984               | H. G. Independent All Lint Fertilizer.....                                                         | Independent Oil & Fert. Works,<br>Columbus .....<br>Guarantee..... |
| 8077               | JACKSON FERTILIZER Co.,<br>Jackson, Miss.<br>H. G. Acid Phosphate .....                            | The Lampton Co., Columbia.....                                     |
| 8119               | H. G. Acid Phosphate .....                                                                         | P. M. Catchings & Co., Pinola.....                                 |
| 8242               | H. G. Acid Phosphate .....                                                                         | Centreville Merc. Co., Centreville.....                            |
| 8293               | H. G. Acid Phosphate .....                                                                         | I. N. Varnado's Sons Co., Osyka.....                               |
| 8294               | H. G. Acid Phosphate .....                                                                         | Barney-Johns & Co., Gloster.....                                   |
| 8295               | H. G. Acid Phosphate .....                                                                         | Rice Merc. Co., Liberty .....                                      |
| 8296               | H. G. Acid Phosphate .....                                                                         | J. W. Grantham & Co., Terry.....                                   |
| 8297               | H. G. Acid Phosphate .....                                                                         | Lampton & Rawls Co., Mt. Olive.....                                |
| 8985               | H. G. Acid Phosphate .....                                                                         | I. N. Varnado's Sons Co., Osyka.....                               |
| 8986               | H. G. Acid Phosphate .....                                                                         | W. L. Robinson Co., Liberty.....                                   |
| 8987               | H. G. Acid Phosphate .....                                                                         | Holmes Bros., McComb City.....                                     |
| 8988               | H. G. Acid Phosphate .....                                                                         | Johnson-Hand Co., Ellisville.....                                  |
| 8989               | H. G. Acid Phosphate .....                                                                         | Cohen & Harrel, Woodville.....<br>Average.....<br>Guarantee.....   |
| 7971               | S. G. Black Hawk Acid Phosphate.....                                                               | Story & Co., Forest.....                                           |
| 8078               | S. G. Black Hawk Acid Phosphate.....                                                               | F. L. Riley Merc. Co., New Hebron....                              |
| 8290               | S. G. Black Hawk Acid Phosphate.....                                                               | Holmes Bros., McComb City.....                                     |
| 8291               | S. G. Black Hawk Acid Phosphate.....                                                               | T. B. Gaddis, Morton.....                                          |
| 8292               | S. G. Black Hawk Acid Phosphate.....                                                               | R. F. Everett, Braxton.....                                        |
| 8990               | S. G. Black Hawk Acid Phosphate.....                                                               | Walker-Durr Co., Pinola .....<br>Average.....<br>Guarantee.....    |
| 8079               | H. G. Bone Meal .....                                                                              | The Lampton Co., Columbia .....<br>Guarantee.....                  |
| 7972               | S. G. Chicago R. B. Superphosphate .....                                                           | Lotterhos & Huber Co., Crystal Sp'gs.                              |
| 8243               | S. G. Chicago R. B. Superphosphate .....                                                           | Kent Bros., Hamburg.....                                           |
| 8991               | S. G. Chicago R. B. Superphosphate .....                                                           | Wm. Atchinson & McDonald, Wesson<br>Average.....<br>Guarantee..... |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8983               | 13.28              | 7.23<br>8.00            | 3.31<br>2.00              | 10.54<br>10.00      | 1.07<br>1.00        | 1.65<br>1.65       | 1.94<br>1.50     | \$21.15<br>20.13        |
| 8984               | 13.60              | 7.20<br>8.00            | 3.92<br>2.00              | 11.12<br>10.00      | .75<br>1.00         | 1.63<br>1.65       | 1.92<br>2.00     | 21.68<br>20.70          |
| 8077               | 17.95              | 10.57                   | 2.06                      | 12.63               | 2.81                |                    |                  | 13.69                   |
| 8119               | 17.08              | 10.58                   | 3.18                      | 13.76               | 2.62                |                    |                  | 14.82                   |
| 8242               | 15.98              | 11.58                   | 3.18                      | 14.76               | 1.62                |                    |                  | 15.92                   |
| 8293               | 17.09              | 11.91                   | 2.88                      | 14.79               | 1.45                |                    |                  | 15.98                   |
| 8294               | 17.69              | 11.07                   | 3.64                      | 14.71               | 1.14                |                    |                  | 15.82                   |
| 8295               | 16.92              | 11.00                   | 3.20                      | 14.20               | 2.20                |                    |                  | 15.30                   |
| 8296               | 17.78              | 10.58                   | 3.58                      | 14.16               | 1.19                |                    |                  | 15.22                   |
| 8297               | 18.39              | 12.63                   | 1.77                      | 14.40               | 1.24                |                    |                  | 15.66                   |
| 8985               | 16.88              | 10.43                   | 3.71                      | 14.14               | 1.89                |                    |                  | 15.18                   |
| 8986               | 15.50              | 11.08                   | 4.29                      | 15.37               | 1.32                |                    |                  | 16.48                   |
| 8987               | 17.14              | 10.80                   | 3.75                      | 14.55               | 1.45                |                    |                  | 15.63                   |
| 8988               | 16.87              | 10.36                   | 4.04                      | 14.40               | 1.50                |                    |                  | 15.44                   |
| 8989               | 17.46              | 10.22                   | 4.39                      | 14.61               | .83                 |                    |                  | 15.63                   |
|                    | <b>17.13</b>       | <b>10.98</b>            | <b>3.36</b>               | <b>14.34</b>        | <b>1.64</b>         |                    |                  | <b>15.44</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 1.00                |                    |                  | 15.20                   |
| 7971               | 15.22              | 9.34                    | 3.76                      | 13.10               | 1.82                |                    |                  | 14.03                   |
| 8078               | 16.06              | 10.81                   | 2.72                      | 13.53               | 2.02                |                    |                  | 14.61                   |
| 8290               | 14.93              | 9.97                    | 3.06                      | 13.03               | 1.15                |                    |                  | 14.03                   |
| 8291               | 13.88              | 9.66                    | 3.07                      | 12.73               | 1.85                |                    |                  | 13.70                   |
| 8292               | 15.49              | 8.32                    | 3.19                      | 11.51               | 2.47                |                    |                  | 12.34                   |
| 8990               | 13.95              | 8.15                    | 4.29                      | 12.44               | 4.16                |                    |                  | 13.26                   |
|                    | <b>14.92</b>       | <b>9.38</b>             | <b>3.35</b>               | <b>12.73</b>        | <b>2.24</b>         |                    |                  | <b>13.67</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 1.00                |                    |                  | 13.00                   |
| 8079               | 6.72               |                         |                           |                     | 27.18<br>22.90      | 2.24<br>2.47       |                  | 22.55<br>21.33          |
| 7972               | 11.23              | 6.36                    | 3.24                      | 9.60                | 1.68                | 2.04               | 1.55             | 21.14                   |
| 8243               | 10.62              | 6.68                    | 3.89                      | 10.57               | 1.51                | 1.89               | 1.35             | 21.41                   |
| 8991               | 10.08              | 5.33                    | 7.06                      | 12.39               | .65                 | 1.67               | 1.47             | 22.53                   |
|                    | <b>10.64</b>       | <b>6.12</b>             | <b>4.73</b>               | <b>10.85</b>        | <b>1.28</b>         | <b>1.87</b>        | <b>1.45</b>      | <b>21.69</b>            |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.53                   |

| Laboratory Number. | Name of Brand and Manufacturer.                | Where and from Whom Collected.                                         |
|--------------------|------------------------------------------------|------------------------------------------------------------------------|
| 8992               | H. G. Fruit & Vegetable Fertilizer.....        | J. W. Grantham & Co., Terry.....                                       |
| 8993               | H. G. Fruit & Vegetable Fertilizer.....        | Lampton & Rawls Co., Mt. Olive.....<br>Guarantee.....                  |
| 8035               | S. G. Gulf States Guano.....                   | Lotterhos & Huber Co., Crystal Sp'gs.<br>Guarantee.....                |
| 8994               | H. G. Huber's Veribest .....                   | Lotterhos & Huber Co., Crystal Sp'gs.                                  |
| 8995               | H. G. Huber's Veribest .....                   | Lotterhos & Huber Co., Crystal Sp'gs.<br>Guarantee.....                |
| 7973               | S. G. Lampton's Am. R. B. Superphosphate ..... | Lotterhos & Huber Co., Crystal Sp'gs.                                  |
| 8080               | S. G. Lampton's Am. R. B. Superphosphate ..... | Lampton & Rawls Co., Silver Creek....                                  |
| 8996               | S. G. Lampton's Am. R. B. Superphosphate ..... | The Lampton Co., Columbia.....                                         |
| 8997               | S. G. Lampton's Am. R. B. Superphosphate ..... | Lampton Merc. Co., Magnolia.....<br>Average.....<br>Guarantee.....     |
| 7974               | S. G. Royal "C" Brand .....                    | T. B. Gaddis, Morton.....                                              |
| 7975               | S. G. Royal "C" Brand .....                    | Story & Co., Forest.....                                               |
| 7976               | S. G. Royal "C" Brand .....                    | Lotterhos & Huber Co., Crystal Sp'gs.                                  |
| 8036               | S. G. Royal "C" Brand .....                    | A. C. Seavey & Sons, Brookhaven .....                                  |
| 8081               | S. G. Royal "C" Brand .....                    | The Lampton Co., Columbia.....                                         |
| 8202               | S. G. Royal "C" Brand .....                    | Vaiden Merc. Co., Vaiden.....                                          |
| 8203               | S. G. Royal "C" Brand .....                    | Johnson-Woodward Co., Mt. Olive....                                    |
| 8244               | S. G. Royal "C" Brand .....                    | Barney-Johns & Co., Gloster.....                                       |
| 8245               | S. G. Royal "C" Brand .....                    | Lampton Merc. Co., Magnolia.....                                       |
| 8246               | S. G. Royal "C" Brand .....                    | Holmes Bros., McComb City.....                                         |
| 8247               | S. G. Royal "C" Brand .....                    | R. W. Fagan & Co., Waynesboro.....                                     |
| 8998               | S. G. Royal "C" Brand .....                    | I. W. McLarty & Co., Water Valley....                                  |
| 8999               | S. G. Royal "C" Brand .....                    | Blackston Merc. Co., Winona.....                                       |
| 9000               | S. G. Royal "C" Brand .....                    | Moreton-Wentworth Co., Brookhaven .....                                |
| 9001               | S. G. Royal "C" Brand .....                    | I. N. Varnado's Sons Co., Osyka.....                                   |
| 9002               | S. G. Royal "C" Brand .....                    | The Dunnagin-Whitaker Co., Laurel....                                  |
| 9003               | S. G. Royal "C" Brand .....                    | Crawford & Coleman, Noxapater.....                                     |
| 9004               | S. G. Royal "C" Brand .....                    | The Fair Company, Louisville.....                                      |
| 9005               | S. G. Royal "C" Brand .....                    | J. G. Ervin, Wier.....                                                 |
| 9006               | S. G. Royal "C" Brand .....                    | Jackson-Wallace Co., Kosciusko.....                                    |
| 9007               | S. G. Royal "C" Brand .....                    | S. Bernheimer & Son, Port Gibson....<br>Average.....<br>Guarantee..... |
| 8120               | S. G. German Kainit .....                      | P. M. Catchings & Co., Pinola.....                                     |
| 9008               | S. G. German Kainit .....                      | Story & Company, Forest.....<br>Guarantee.....                         |
|                    | JEFFERSON FERTILIZER CO.,<br>Birmingham, Ala.  |                                                                        |
| 8121               | H. G. Jefferson English Acid Phosphate.....    | C. L. Cross & Co., Enterprise.....<br>Guarantee.....                   |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8992               | 11.57              | 4.67                    | 2.38                      | 7.05                | .95                 | 3.11               | 3.73             | \$24.95                 |
| 8993               | 11.96              | 4.87                    | 2.45                      | 7.32                | .58                 | 2.84               | 3.66             | 24.11                   |
|                    |                    | 3.00                    | 3.00                      | 6.00                | 1.00                | 3.00               | 4.00             | 23.50                   |
| 8035               | 15.09              | 6.97                    | 2.42                      | 9.39                | 1.54                | 1.49               | 1.95             | 19.23                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.80             | 19.27                   |
| 8994               | 11.07              | 4.50                    | 3.82                      | 8.32                | .92                 | 3.45               | 3.14             | 27.01                   |
| 8995               | 15.96              | 4.49                    | 3.58                      | 8.07                | 1.15                | 3.96               | 3.13             | 28.77                   |
|                    |                    | 5.50                    | 2.00                      | 7.50                | 1.00                | 3.85               | 3.00             | 27.65                   |
| 7973               | 12.87              | 5.74                    | 1.51                      | 7.25                | 1.41                | 3.87               | 2.02             | 26.35                   |
| 8080               | 9.91               | 6.04                    | 3.79                      | 9.83                | 1.73                | 2.12               | 1.52             | 21.65                   |
| 8996               | 10.59              | 5.16                    | 5.42                      | 10.58               | 1.52                | 1.65               | 1.25             | 20.19                   |
| 8997               | 10.43              | 4.95                    | 5.79                      | 10.74               | 2.44                | 1.67               | 1.29             | 20.47                   |
|                    | 10.95              | 5.47                    | 4.13                      | 9.60                | 1.78                | 2.33               | 1.52             | 22.17                   |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.53                   |
| 7974               | 12.80              | 6.90                    | 2.67                      | 9.57                | 1.75                | 1.63               | 2.01             | 20.05                   |
| 7975               | 12.27              | 6.68                    | 2.97                      | 9.65                | 1.34                | 1.62               | 2.16             | 20.25                   |
| 7976               | 11.33              | 6.55                    | 1.97                      | 8.52                | 1.68                | 1.96               | 2.33             | 20.55                   |
| 8036               | 13.02              | 6.61                    | 2.52                      | 9.13                | 1.92                | 1.59               | 2.07             | 19.44                   |
| 8081               | 12.00              | 6.61                    | 2.86                      | 9.47                | 1.69                | 1.79               | 1.92             | 20.45                   |
| 8202               | 15.15              | 7.00                    | 2.32                      | 9.32                | 1.79                | 1.79               | 1.56             | 19.91                   |
| 8203               | 13.92              | 6.68                    | 2.42                      | 9.10                | 1.47                | 1.89               | 1.83             | 20.34                   |
| 8244               | 13.98              | 7.13                    | 2.51                      | 9.64                | 1.19                | 1.87               | 2.01             | 21.11                   |
| 8245               | 13.14              | 7.10                    | 2.26                      | 9.36                | 1.57                | 1.91               | 1.95             | 20.89                   |
| 8246               | 14.22              | 7.27                    | 2.40                      | 9.67                | 1.38                | 1.79               | 1.94             | 20.76                   |
| 8247               | 13.81              | 7.05                    | 2.35                      | 9.40                | 1.52                | 1.83               | 1.84             | 20.48                   |
| 8998               | 12.55              | 6.41                    | 3.47                      | 9.88                | 1.27                | 1.85               | 1.85             | 21.04                   |
| 8999               | 14.02              | 6.84                    | 2.97                      | 9.81                | 1.15                | 1.83               | 1.95             | 21.04                   |
| 9000               | 13.48              | 6.67                    | 3.37                      | 10.04               | 1.11                | 1.70               | 1.93             | 20.73                   |
| 9001               | 14.53              | 6.87                    | 3.06                      | 9.93                | .95                 | 1.81               | 1.83             | 20.95                   |
| 9002               | 14.08              | 6.29                    | 3.08                      | 9.37                | 1.69                | 1.67               | 1.88             | 19.78                   |
| 9003               | 14.92              | 6.67                    | 2.76                      | 9.43                | 1.16                | 1.78               | 1.88             | 20.32                   |
| 9004               | 14.60              | 6.67                    | 3.25                      | 9.92                | .91                 | 1.73               | 1.81             | 20.58                   |
| 9005               | 13.47              | 6.17                    | 3.66                      | 9.83                | 1.16                | 1.86               | 1.92             | 21.08                   |
| 9006               | 14.86              | 7.02                    | 2.59                      | 9.61                | 1.29                | 1.81               | 1.81             | 20.59                   |
| 9007               | 14.83              | 6.68                    | 2.79                      | 9.47                | 1.59                | 1.81               | 1.80             | 20.40                   |
|                    | 13.67              | 6.76                    | 2.77                      | 9.53                | 1.41                | 1.79               | 1.91             | 20.51                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.80             | 19.27                   |
| 8120               | 5.33               |                         |                           |                     |                     |                    | 12.24            | 14.08                   |
| 9008               | 2.79               |                         |                           |                     |                     |                    | 12.62            | 14.51                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
| 8121               | 15.19              | 8.44                    | 3.10                      | 11.54               | 2.53                |                    |                  | 12.38                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |



TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                                        |
|--------------------|---------------------------------------------------------|-----------------------------------------------------------------------|
| 8122               | S. G. Jefferson Meal Acid & Potash Mixture .....        | C. L. Cross & Co., Enterprise.....                                    |
| 9009               | S. G. Jefferson Meal Acid & Potash Mixture .....        | Bourland Bros., Amory.....<br>Guarantee .....                         |
|                    | KOSCIUSKO OIL MILL & FERT. COMPANY,<br>Kosciusko, Miss. |                                                                       |
| 8014               | H. G. Acid Phosphate .....                              | Jackson Wallace Co., Kosciusko.....                                   |
| 8248               | H. G. Acid Phosphate .....                              | W. B. Potts & Sons, Kosciusko.....                                    |
| 9010               | H. G. Acid Phosphate .....                              | R. W. Kelley, Kosciusko.....<br>Average.....<br>Guarantee .....       |
| 7942               | S. G. Peerless Guano.....                               | Henderson-Molphus Co., Philadelphia.....                              |
| 8015               | S. G. Peerless Guano.....                               | W. B. Potts & Sons, Kosciusko.....                                    |
| 8249               | S. G. Peerless Guano.....                               | O. L. Shaw, Ackerman.....                                             |
| 8250               | S. G. Peerless Guano.....                               | R. W. Kelley, Kosciusko.....                                          |
| 9011               | S. G. Peerless Guano.....                               | G. Lowenberg & Co., Kosciusko.....<br>Average.....<br>Guarantee ..... |
|                    | LAUREL OIL & FERT. Co.,<br>Laurel, Miss.                |                                                                       |
| 7943               | H. G. Acid Phosphate .....                              | J. F. Wilson, Philadelphia.....                                       |
| 7944               | H. G. Acid Phosphate .....                              | Laurel Oil & Fert. Co., Laurel.....                                   |
| 8082               | H. G. Acid Phosphate .....                              | D. C. Griffith & Co., Silver Creek.....                               |
| 9012               | H. G. Acid Phosphate .....                              | T. F. Abney, Montrose.....<br>Average.....<br>Guarantee .....         |
| 7945               | S. G. Acid Phosphate .....                              | Laurel Oil & Fert. Co., Laurel.....                                   |
| 9013               | S. G. Acid Phosphate .....                              | J. H. McGowan, Pachuta.....                                           |
| 9014               | S. G. Acid Phosphate .....                              | W. T. Day, Mt. Olive.....<br>Average.....<br>Guarantee .....          |
| 8083               | S. G. K. C. Ammoniated<br>Bone .....                    | D. C. Griffith & Co., Silver Creek.....                               |
| 8204               | S. G. K. C. Ammoniated<br>Bone .....                    | E. B. Perry, Taylorsville.....                                        |
| 9015               | S. G. K. C. Ammoniated<br>Bone .....                    | Abney & Travis, Heidelberg.....                                       |
| 9016               | S. G. K. C. Ammoniated<br>Bone .....                    | R. F. Walden & Co., Prentiss.....<br>Average.....<br>Guarantee .....  |
| 7946               | S. G. Plow Brand .....                                  | J. F. Wilson, Philadelphia.....                                       |
| 8048               | S. G. Plow Brand .....                                  | Laurel Oil & Fert. Co., Laurel.....                                   |
| 8084               | S. G. Plow Brand .....                                  | W. W. Pigford, Lumberton.....                                         |
| 8123               | S. G. Plow Brand .....                                  | E. E. Bonner, Sandersville.....                                       |
| 9017               | S. G. Plow Brand .....                                  | The T. B. Bonner Co., Laurel.....                                     |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8122               | 12.08              | 5.97                    | 2.10                      | 8.07                | 1.10                | 1.58               | 2.52             | \$18.69                 |
| 9009               | 13.11              | 3.97<br>6.00            | 2.87<br>2.00              | 6.84<br>8.00        | .48<br>2.00         | 1.72<br>1.65       | 2.26<br>2.00     | 17.40<br>18.30          |
| 8014               | 15.81              | 11.58                   | 3.12                      | 14.70               | 1.06                |                    |                  | 15.86                   |
| 8248               | 17.67              | 11.41                   | 3.63                      | 15.04               | .33                 |                    |                  | 16.18                   |
| 9010               | 16.60              | 10.68                   | 4.34                      | 15.02               | .51                 |                    |                  | 16.09                   |
|                    | <b>16.69</b>       | <b>11.22</b>            | <b>3.70</b>               | <b>14.92</b>        | <b>.63</b>          |                    |                  | <b>16.04</b>            |
|                    |                    | 11.00                   | 3.00                      | 14.00               | 1.00                |                    |                  | 15.10                   |
| 7942               | 11.84              | 7.33                    | 2.86                      | 10.19               | .63                 | 1.66               | 2.04             | 20.93                   |
| 8015               | 12.22              | 7.46                    | 2.39                      | 9.85                | .97                 | 1.73               | 1.91             | 20.70                   |
| 8249               | 12.88              | 7.45                    | 2.43                      | 9.88                | 1.04                | 1.68               | 2.20             | 20.86                   |
| 8250               | 12.85              | 7.68                    | 2.59                      | 10.27               | .90                 | 1.69               | 1.92             | 21.03                   |
| 9011               | 13.18              | 6.86                    | 3.35                      | 10.21               | 1.38                | 1.67               | 1.81             | 20.68                   |
|                    | <b>12.59</b>       | <b>7.36</b>             | <b>2.72</b>               | <b>10.08</b>        | <b>.98</b>          | <b>1.69</b>        | <b>1.97</b>      | <b>20.84</b>            |
|                    |                    | 8.00                    | 1.50                      | 9.50                | 1.00                | 1.67               | 1.75             | 19.94                   |
| 7943               | 15.94              | 10.91                   | 2.19                      | 13.10               | 2.53                |                    |                  | 14.19                   |
| 7944               | 16.06              | 10.91                   | 2.19                      | 13.10               | 2.46                |                    |                  | 14.19                   |
| 8082               | 16.43              | 10.84                   | 3.66                      | 14.50               | 1.38                |                    |                  | 15.58                   |
| 9012               | 16.46              | 10.54                   | 3.31                      | 13.85               | .19                 |                    |                  | 14.90                   |
|                    | <b>16.22</b>       | <b>10.80</b>            | <b>2.84</b>               | <b>13.64</b>        | <b>1.64</b>         |                    |                  | <b>14.72</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 7945               | 17.26              | 10.99                   | 2.68                      | 13.67               | 1.71                |                    |                  | 14.77                   |
| 9013               | 16.69              | 9.67                    | 3.79                      | 13.46               | 1.75                |                    |                  | 14.43                   |
| 9014               | 16.39              | 8.79                    | 4.27                      | 13.06               | 1.56                |                    |                  | 13.94                   |
|                    | <b>16.78</b>       | <b>9.82</b>             | <b>3.58</b>               | <b>13.40</b>        | <b>1.67</b>         |                    |                  | <b>14.38</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 3.00                |                    |                  | 15.00                   |
| 8083               | 11.40              | 8.48                    | 3.43                      | 11.91               | 1.51                | 1.47               | 2.16             | 22.31                   |
| 8204               | 11.64              | 8.26                    | 3.46                      | 11.72               | 1.27                | 1.52               | 2.03             | 22.13                   |
| 9015               | 12.81              | 7.41                    | 3.36                      | 10.77               | .54                 | 1.45               | 1.95             | 20.63                   |
| 9016               | 11.70              | 6.59                    | 3.77                      | 10.36               | .45                 | 1.48               | 2.25             | 20.56                   |
|                    | <b>11.89</b>       | <b>7.69</b>             | <b>3.50</b>               | <b>11.19</b>        | <b>.94</b>          | <b>1.48</b>        | <b>2.10</b>      | <b>22.13</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.00               | 2.00             | 18.10                   |
| 7946               | 13.96              | 7.23                    | 2.53                      | 9.76                | 1.41                | 1.63               | 1.60             | 19.82                   |
| 8048               | 11.37              | 5.82                    | 3.70                      | 9.52                | 2.06                | 1.66               | 1.70             | 19.65                   |
| 8084               | 13.44              | 7.98                    | 2.53                      | 10.51               | 1.66                | 1.67               | 2.10             | 21.45                   |
| 8123               | 14.57              | 7.16                    | 2.44                      | 9.60                | 1.75                | 1.90               | 1.75             | 20.89                   |
| 9017               | 15.53              | 6.98                    | 2.53                      | 9.51                | 1.66                | 1.79               | 1.60             | 20.16                   |

| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.                          |
|--------------------|---------------------------------------------------|---------------------------------------------------------|
| 9018               | S. G. Plow Brand .....                            | J. R. Caldwell, Ellisville.....                         |
| 9019               | S. G. Plow Brand .....                            | Spivey & Scarbrough, Decatur.....                       |
|                    |                                                   | Average.....                                            |
|                    |                                                   | Guarantee.....                                          |
|                    | LOTTERHOS & HUBER Co.,<br>Crystal Springs, Miss.  |                                                         |
| 8477               | Castor Pomace.....                                | Lotterhos & Huber Co., Crystal Sp'gs.<br>Guarantee..... |
|                    | MARBACH & EAGAN,<br>Crystal Springs, Miss.        |                                                         |
| 8205               | H. G. Bat Guano .....                             | Lotterhos & Huber Co., Crystal Sp'gs.<br>Guarantee..... |
|                    | P. B. MATHIASON M'F'G. Co.,<br>St. Louis, Mo.     |                                                         |
| 9020               | H. G. Increscent Brand<br>Extra Ground Bone ..... | M. W. Buckley & Sons, Enterprise...<br>Guarantee.....   |
| 9021               | S. G. Increscent Brand<br>Southern Special .....  | M. W. Buckley & Sons, Enterprise...<br>Guarantee.....   |
|                    | MERIDIAN FERT. FACTORY,<br>Meridian, Miss.        |                                                         |
| 8251               | S. G. Meridian English Acid<br>Phosphate.....     | A. D. Crenshaw & Sons, Neshoba.....                     |
| 9022               | S. G. Meridian English Acid<br>Phosphate.....     | W. M. Sheffield, Maben.....                             |
| 9023               | S. G. Meridian English Acid<br>Phosphate.....     | A. E. Dalrymple Sons Co., Amory.....                    |
| 9024               | S. G. Meridian English Acid<br>Phosphate.....     | J. M. Carter, Quitman.....                              |
| 9025               | S. G. Meridian English Acid<br>Phosphate.....     | H. N. Stuart, Morton.....                               |
| 9026               | S. G. Meridian English Acid<br>Phosphate.....     | R. C. Combs, Shuqualak.....                             |
| 9027               | S. G. Meridian English Acid<br>Phosphate.....     | Williams & Freeman, Sandersville...<br>Average.....     |
|                    |                                                   | Guarantee.....                                          |
| 7977               | H. G. Meridian Southern<br>Acid Phosphate .....   | Brandon Merc. Co., Brandon.....                         |
| 8049               | H. G. Meridian Southern<br>Acid Phosphate .....   | T. M. Steele, Forest.....                               |
| 8124               | H. G. Meridian Southern<br>Acid Phosphate .....   | George Robinson, Pelahatchie.....                       |
| 8166               | H. G. Meridian Southern<br>Acid Phosphate .....   | Wygul Bros., Nettleton.....                             |
| 8167               | H. G. Meridian Southern<br>Acid Phosphate .....   | Philips, Reinhart, Taylor & Co.,<br>Booneville.....     |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 9018               | 15.85              | 6.93                    | 2.99                      | 9.92                | 1.57                | 1.82               | 1.64             | \$20.77                 |
| 9019               | 15.84              | 7.11                    | 2.77                      | 9.88                | 1.69                | 1.87               | 1.73             | 21.05                   |
|                    | <b>14.37</b>       | <b>7.03</b>             | <b>2.79</b>               | <b>9.82</b>         | <b>1.69</b>         | <b>1.76</b>        | <b>1.73</b>      | <b>20.54</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.80               | 1.50             | 19.53                   |
| 8477               | 14.61              |                         |                           |                     | 1.97                | 4.88               | .98              | 21.63                   |
|                    |                    |                         |                           |                     | 1.50                | 4.50               | .50              | 19.33                   |
| 8205               | 23.01              |                         |                           |                     | 8.78                | 4.84               | 1.19             | 25.12                   |
|                    |                    |                         |                           |                     | 5.00                | 3.50               | .63              | 17.22                   |
| 9020               | 7.96               |                         |                           |                     | 23.36               | 1.08               |                  | 16.00                   |
|                    |                    |                         |                           |                     | 22.00               | 2.05               |                  | 19.20                   |
| 9021               | 11.35              | 5.35                    | 4.73                      | 10.08               | 1.74                | 2.28               | 1.94             | 22.97                   |
|                    |                    | 4.00                    | 5.00                      | 9.00                | 3.00                | 2.47               | 2.00             | 22.48                   |
| 8251               | 14.00              | 8.33                    | 5.26                      | 13.59               | 1.27                |                    |                  | 14.42                   |
| 9022               | 14.98              | 7.09                    | 4.92                      | 12.01               | 2.09                |                    |                  | 12.72                   |
| 9023               | 10.50              | 7.61                    | 6.02                      | 13.63               | 3.44                |                    |                  | 14.39                   |
| 9024               | 15.79              | 7.50                    | 4.85                      | 12.35               | 2.07                |                    |                  | 13.10                   |
| 9025               | 14.21              | 9.77                    | 5.08                      | 14.85               | .78                 |                    |                  | 15.83                   |
| 9026               | 14.88              | 7.41                    | 5.42                      | 12.83               | 1.37                |                    |                  | 13.57                   |
| 9027               | 15.77              | 8.62                    | 3.29                      | 11.91               | 2.29                |                    |                  | 12.77                   |
|                    | <b>14.30</b>       | <b>8.05</b>             | <b>4.97</b>               | <b>13.02</b>        | <b>1.90</b>         |                    |                  | <b>13.83</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 1.00                |                    |                  | 13.00                   |
| 7977               | 16.08              | 10.95                   | 5.34                      | 16.29               | .35                 |                    |                  | 17.39                   |
| 8049               | 17.34              | 9.25                    | 4.74                      | 13.99               | .56                 |                    |                  | 14.92                   |
| 8124               | 16.72              | 10.13                   | 4.51                      | 14.64               | .88                 |                    |                  | 15.65                   |
| 8166               | 15.93              | 10.08                   | 4.54                      | 14.62               | .86                 |                    |                  | 15.63                   |
| 8167               | 13.34              | 9.34                    | 4.90                      | 14.24               | 1.71                |                    |                  | 15.17                   |



| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.                                  |
|--------------------|---------------------------------------------------|-----------------------------------------------------------------|
| 9028               | H. G. Meridian Southern Acid Phosphate .....      | A. J. Cotton, Iuka.....                                         |
| 9029               | H. G. Meridian Southern Acid Phosphate .....      | Abney & Travis, Heidelberg.....                                 |
| 9030               | H. G. Meridian Southern Acid Phosphate .....      | J. L. Wells, Hickory.....                                       |
| 9031               | H. G. Meridian Southern Acid Phosphate .....      | Abney & Travis, Heidelberg.....                                 |
| 9032               | H. G. Meridian Southern Acid Phosphate .....      | L. L. Denson, Bay Springs.....                                  |
| 9033               | H. G. Meridian Southern Acid Phosphate .....      | W. L. Richardson, Newton.....                                   |
| 9034               | H. G. Meridian Southern Acid Phosphate .....      | McClain & Tatum, Gloster.....                                   |
| 9035               | H. G. Meridian Southern Acid Phosphate .....      | J. N. Alexander, Kosciusko.....                                 |
| 9036               | H. G. Meridian Southern Acid Phosphate .....      | J. K. Kirkland, Quitman.....                                    |
| 9037               | H. G. Meridian Southern Acid Phosphate .....      | Brushey Commercial Co., Shipman...                              |
| 9038               | H. G. Meridian Southern Acid Phosphate .....      | J. W. Hamilton, Houlka.....<br>Average.....<br>Guarantee.....   |
| 9039               | H. G. Meridian Union Special Acid Phosphate ..... | Holloway & McRaney, Collins.....                                |
| 9040               | H. G. Meridian Union Special Acid Phosphate ..... | Parkman, Byrd & Co., Mt. Olive.....<br>Guarantee.....           |
| 8085               | S. G. Meridian Blood & Bone                       | Meridian Fert. Factory, Hattiesburg                             |
| 8125               | S. G. Meridian Blood & Bone                       | S. H. Andrews, Enterprise.....                                  |
| 9041               | S. G. Meridian Blood & Bone                       | Liberty Merc. Co., Liberty.....                                 |
| 9042               | S. G. Meridian Blood & Bone                       | Stevens & Ruffin, New Augusta.....                              |
| 9043               | S. G. Meridian Blood & Bone                       | Berry & Murray, Star.....                                       |
| 9044               | S. G. Meridian Blood & Bone                       | John McGrath & Sons, Brookhaven...                              |
| 9045               | S. G. Meridian Blood & Bone                       | Jeff Griffis Merc. Co., Beaumont.....                           |
| 9046               | S. G. Meridian Blood & Bone                       | R. Watts & Co., Seminary.....<br>Average.....<br>Guarantee..... |
| 7947               | S. G. Meridian Home Mixture                       | A. Dewesse & Co., Philadelphia.....                             |
| 7948               | S. G. Meridian Home Mixture                       | W. M. Pilgrim, Philadelphia.....                                |
| 7978               | S. G. Meridian Home Mixture                       | Brandon Merc. Co., Brandon.....                                 |
| 8037               | S. G. Meridian Home Mixture                       | John McGrath & Sons, Brookhaven...                              |
| 8050               | S. G. Meridian Home Mixture                       | T. B. Gaddis, Morton.....                                       |
| 8051               | S. G. Meridian Home Mixture                       | T. M. Steele, Forest.....                                       |
| 8086               | S. G. Meridian Home Mixture                       | J. H. Williams & Sons, Prentiss.....                            |
| 8087               | S. G. Meridian Home Mixture                       | Harrison-Nelson Co., Magee.....                                 |
| 8088               | S. G. Meridian Home Mixture                       | Holloway & McRaney, Collins.....                                |
| 8126               | S. G. Meridian Home Mixture                       | Williams & Freeman, Sandersville....                            |
| 8127               | S. G. Meridian Home Mixture                       | Carson Mercantile Co., Carson.....                              |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 9028               | 16.46              | 8.72                    | 5.39                      | 14.11               | 1.09                |                    |                  | \$14.98                 |
| 9029               | 14.18              | 8.64                    | 5.43                      | 14.07               | 1.55                |                    |                  | 14.93                   |
| 9030               | 15.83              | 9.48                    | 4.58                      | 14.06               | 1.04                |                    |                  | 15.01                   |
| 9031               | 14.78              | 9.53                    | 4.69                      | 14.22               | .92                 |                    |                  | 15.17                   |
| 9032               | 15.35              | 8.70                    | 2.68                      | 11.38               | 2.35                |                    |                  | 12.25                   |
| 9033               | 15.88              | 9.20                    | 4.74                      | 13.94               | 1.15                |                    |                  | 14.86                   |
| 9034               | 13.02              | 7.38                    | 6.43                      | 13.81               | 1.29                |                    |                  | 14.55                   |
| 9035               | 14.80              | 8.15                    | 4.93                      | 13.08               | 1.23                |                    |                  | 13.90                   |
| 9036               | 14.89              | 9.45                    | 4.89                      | 14.34               | 1.25                |                    |                  | 15.29                   |
| 9037               | 13.27              | 7.98                    | 5.12                      | 13.10               | 1.15                |                    |                  | 13.90                   |
| 9038               | 15.40              | 8.47                    | 5.21                      | 13.68               | .83                 |                    |                  | 14.53                   |
|                    | <b>15.20</b>       | <b>9.09</b>             | <b>4.88</b>               | <b>13.97</b>        | <b>1.14</b>         |                    |                  | <b>14.88</b>            |
|                    |                    | <i>12.00</i>            | <i>2.00</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>15.20</i>            |
| 9039               | 16.28              | 10.38                   | 5.54                      | 15.92               | .52                 |                    |                  | 16.96                   |
| 9040               | 16.97              | 10.24                   | 3.14                      | 13.38               | 1.47                |                    |                  | 14.40                   |
|                    |                    | <i>13.00</i>            | <i>3.00</i>               | <i>16.00</i>        | <i>1.00</i>         |                    |                  | <i>17.30</i>            |
| 8085               | 12.36              | 8.01                    | 3.61                      | 11.62               | 1.05                | 1.53               | 1.87             | 21.85                   |
| 8125               | 15.01              | 7.88                    | 3.12                      | 11.00               | 1.10                | 2.00               | 1.86             | 23.03                   |
| 9041               | 12.19              | 6.05                    | 4.30                      | 10.35               | 1.18                | 1.35               | 1.88             | 19.55                   |
| 9042               | 14.52              | 6.91                    | 4.52                      | 11.43               | .33                 | 2.13               | 2.32             | 24.45                   |
| 9043               | 13.46              | 7.47                    | 4.01                      | 11.48               | 1.22                | 1.46               | 1.76             | 21.24                   |
| 9044               | 13.92              | 6.56                    | 4.48                      | 11.04               | .54                 | 2.49               | 1.66             | 24.67                   |
| 9045               | 12.40              | 5.13                    | 4.02                      | 9.15                | 1.20                | 1.65               | 1.94             | 19.41                   |
| 9046               | 12.99              | 5.56                    | 4.46                      | 10.02               | .43                 | 2.46               | 2.06             | 23.79                   |
|                    | <b>13.35</b>       | <b>6.70</b>             | <b>4.06</b>               | <b>10.76</b>        | <b>.88</b>          | <b>1.88</b>        | <b>1.92</b>      | <b>22.24</b>            |
|                    |                    | <i>8.00</i>             | <i>1.50</i>               | <i>9.50</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>1.50</i>      | <i>19.58</i>            |
| 7947               | 13.50              | 7.43                    | 2.90                      | 10.33               | 1.01                | 1.48               | 1.91             | 20.22                   |
| 7948               | 13.03              | 6.91                    | 3.26                      | 10.17               | 1.23                | 1.59               | 1.85             | 20.37                   |
| 7978               | 14.13              | 8.01                    | 3.50                      | 11.51               | .41                 | 1.58               | 2.19             | 22.30                   |
| 8037               | 13.36              | 6.20                    | 3.62                      | 9.82                | 1.10                | 1.65               | 1.89             | 20.20                   |
| 8050               | 12.79              | 7.01                    | 3.36                      | 10.37               | 1.52                | 1.74               | 2.16             | 21.55                   |
| 8051               | 12.84              | 8.05                    | 3.38                      | 11.43               | .90                 | 1.68               | 2.41             | 22.87                   |
| 8086               | 12.86              | 5.58                    | 5.21                      | 10.79               | .05                 | 1.74               | 1.96             | 21.64                   |
| 8087               | 13.51              | 6.28                    | 3.57                      | 9.85                | 1.02                | 1.80               | 1.95             | 20.91                   |
| 8088               | 13.17              | 5.54                    | 4.03                      | 9.57                | 1.28                | 1.58               | 2.06             | 19.77                   |
| 8126               | 13.76              | 5.74                    | 4.16                      | 9.90                | .90                 | 1.83               | 1.88             | 20.95                   |
| 8127               | 13.95              | 5.99                    | 3.83                      | 9.82                | .81                 | 1.84               | 2.07             | 21.14                   |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer. | Where and from Whom Collected.          |
|--------------------|---------------------------------|-----------------------------------------|
| 8168               | S. G. Meridian Home Mixture     | Lann & Carter, Aberdeen.....            |
| 8169               | S. G. Meridian Home Mixture     | Barnes, Youngblood & Co., Baldwyn....   |
| 8206               | S. G. Meridian Home Mixture     | T. W. Foard, Eupora.....                |
| 9047               | S. G. Meridian Home Mixture     | Davis & Bufkin, Buckatunna.....         |
| 9048               | S. G. Meridian Home Mixture     | The Batson-Bond Co., Bond.....          |
| 9049               | S. G. Meridian Home Mixture     | Hawkins McRaney Co., Bassfield.....     |
| 9050               | S. G. Meridian Home Mixture     | Jeff Griffis Merc. Co., Beaumont.....   |
| 9051               | S. G. Meridian Home Mixture     | Barnes & Co., Columbia.....             |
| 9052               | S. G. Meridian Home Mixture     | R. H. Day & Co., Decatur.....           |
| 9053               | S. G. Meridian Home Mixture     | S. H. Andrews, Enterprise.....          |
| 9054               | S. G. Meridian Home Mixture     | Ruffin Merc. Co., Ellisville.....       |
| 9055               | S. G. Meridian Home Mixture     | W. L. Martin, Florence.....             |
| 9056               | S. G. Meridian Home Mixture     | Max Kohn, Gloster.....                  |
| 9057               | S. G. Meridian Home Mixture     | J. L. Wells, Hickory.....               |
| 9058               | S. G. Meridian Home Mixture     | Brand West Hardware Co., Houston        |
| 9059               | S. G. Meridian Home Mixture     | J. A. McLeod Co., Hattiesburg.....      |
| 9060               | S. G. Meridian Home Mixture     | A. J. Cotton, Iuka.....                 |
| 9061               | S. G. Meridian Home Mixture     | Lucedale Commercial Co., Lucedale....   |
| 9062               | S. G. Meridian Home Mixture     | J. E. McNair, Lumberton.....            |
| 9063               | S. G. Meridian Home Mixture     | Dunnagin-Whitaker Co., Laurel.....      |
| 9064               | S. G. Meridian Home Mixture     | W. M. Sheffield, Maben.....             |
| 9065               | S. G. Meridian Home Mixture     | T. C. Ruble, McHenry.....               |
| 9066               | S. G. Meridian Home Mixture     | Johnson-Woodward Co., Mt. Olive....     |
| 9067               | S. G. Meridian Home Mixture     | G. Lowenberg, McCool.....               |
| 9068               | S. G. Meridian Home Mixture     | J. D. Gamble, Mize.....                 |
| 9069               | S. G. Meridian Home Mixture     | M. L. Brinson, Monticello.....          |
| 9070               | S. G. Meridian Home Mixture     | J. H. Williams, Macon.....              |
| 9071               | S. G. Meridian Home Mixture     | George Robinson, pelahatchie.....       |
| 9072               | S. G. Meridian Home Mixture     | T. J. Cole & Co., Ripley.....           |
| 9073               | S. G. Meridian Home Mixture     | J. K. Kirkland, Quitman.....            |
| 9074               | S. G. Meridian Home Mixture     | Stevens & Ruffin, Richton.....          |
| 9075               | S. G. Meridian Home Mixture     | Duke Merc. Co., Scooba.....             |
| 9076               | S. G. Meridian Home Mixture     | Mrs. R. J. Briggs, State Line.....      |
| 9077               | S. G. Meridian Home Mixture     | M. H. Turner, Vossburg.....             |
| 9078               | S. G. Meridian Home Mixture     | Berry & Murray, Star.....               |
| 9079               | S. G. Meridian Home Mixture     | J. S. Eaton & Bro., Taylorsville.....   |
| 9080               | S. G. Meridian Home Mixture     | Smith & Gibson, Union.....              |
| 9081               | S. G. Meridian Home Mixture     | Hitthart & Blackston Co., Winona....    |
|                    |                                 | Average.....                            |
|                    |                                 | Guarantee.....                          |
| 7979               | S. G. Meridian Soluble Bone     | H. N. Stuart, Morton.....               |
|                    |                                 | Guarantee.....                          |
| 8089               | H. G. Meridian Veg. Grower      | Meridian Fertilizer Factory, Hattiesb'g |
|                    |                                 | Guarantee.....                          |
| 8252               | S. G. Meridian German           |                                         |
|                    | Kainit .....                    | A. D. Crenshaw & Sons, Neshoba.....     |
| 9082               | S. G. Meridian German           |                                         |
|                    | Kainit .....                    | W. C. Hindes & Son, Guntown.....        |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8168               | 13.57              | 5.65                    | 4.97                      | 10.62               | 1.87                | 1.62               | 1.59             | \$20.56                 |
| 8169               | 16.22              | 7.22                    | 3.36                      | 10.58               | 1.28                | 2.08               | 1.75             | 22.69                   |
| 8206               | 13.00              | 6.45                    | 3.82                      | 10.27               | 1.77                | 1.88               | 2.44             | 22.27                   |
| 9047               | 13.64              | 6.36                    | 4.21                      | 10.57               | .88                 | 1.85               | 1.92             | 21.87                   |
| 9048               | 14.46              | 5.97                    | 3.81                      | 9.78                | .92                 | 1.65               | 1.73             | 19.94                   |
| 9049               | 14.84              | 6.65                    | 3.16                      | 9.81                | .78                 | 1.84               | 1.68             | 20.75                   |
| 9050               | 15.41              | 6.51                    | 3.32                      | 9.83                | 1.04                | 1.87               | 1.83             | 21.05                   |
| 9051               | 11.28              | 7.27                    | 2.46                      | 9.73                | 1.05                | 1.72               | 1.97             | 20.58                   |
| 9052               | 13.87              | 5.64                    | 3.99                      | 9.63                | 1.10                | 1.78               | 1.70             | 20.23                   |
| 9053               | 16.32              | 6.41                    | 3.27                      | 9.68                | 2.16                | 1.69               | 1.93             | 20.27                   |
| 9054               | 15.06              | 7.25                    | 2.83                      | 10.08               | 1.01                | 1.59               | 1.87             | 20.32                   |
| 9055               | 14.32              | 5.73                    | 3.29                      | 9.02                | 1.24                | 1.83               | 1.81             | 19.90                   |
| 9056               | 15.55              | 6.00                    | 5.10                      | 11.10               | .58                 | 1.86               | 1.77             | 22.29                   |
| 9057               | 14.61              | 7.11                    | 4.94                      | 12.05               | .50                 | 1.89               | 1.52             | 23.27                   |
| 9058               | 14.56              | 6.67                    | 4.58                      | 11.25               | .81                 | 1.92               | 2.07             | 23.10                   |
| 9059               | 15.17              | 7.38                    | 2.70                      | 10.08               | .88                 | 1.60               | 1.91             | 20.42                   |
| 9060               | 16.35              | 7.09                    | 4.32                      | 11.41               | .47                 | 1.68               | 1.68             | 21.91                   |
| 9061               | 15.34              | 6.73                    | 2.92                      | 9.65                | 1.01                | 1.84               | 1.94             | 20.88                   |
| 9062               | 14.61              | 6.52                    | 2.98                      | 9.50                | .90                 | 1.63               | 1.85             | 19.75                   |
| 9063               | 15.94              | 6.55                    | 2.63                      | 9.18                | 1.23                | 1.76               | 1.94             | 20.02                   |
| 9064               | 14.63              | 7.20                    | 4.69                      | 11.89               | .31                 | 1.87               | 2.22             | 23.83                   |
| 9065               | 15.70              | 5.99                    | 4.08                      | 10.07               | .95                 | 1.68               | 2.10             | 20.81                   |
| 9066               | 14.01              | 5.95                    | 3.88                      | 9.83                | .78                 | 1.67               | 1.87             | 20.24                   |
| 9067               | 13.41              | 5.88                    | 3.97                      | 9.85                | 1.05                | 1.59               | 1.84             | 19.90                   |
| 9068               | 14.74              | 6.95                    | 2.67                      | 9.62                | 1.11                | 1.71               | 1.96             | 20.37                   |
| 9069               | 13.56              | 6.10                    | 3.98                      | 10.08               | .74                 | 1.63               | 1.94             | 20.45                   |
| 9070               | 17.21              | 5.96                    | 5.96                      | 11.92               | .95                 | 1.44               | 1.62             | 21.33                   |
| 9071               | 14.62              | 7.05                    | 5.31                      | 12.36               | .61                 | 1.51               | 1.52             | 22.09                   |
| 9072               | 13.01              | 4.75                    | 5.10                      | 9.85                | .82                 | 1.64               | 1.60             | 19.71                   |
| 9073               | 13.16              | 6.04                    | 4.36                      | 10.40               | .86                 | 1.73               | 2.09             | 21.37                   |
| 9074               | 14.02              | 6.84                    | 3.55                      | 10.39               | 1.05                | 1.39               | 1.61             | 19.52                   |
| 9075               | 14.30              | 5.71                    | 4.31                      | 10.02               | .84                 | 1.68               | 2.02             | 20.64                   |
| 9076               | 13.80              | 6.20                    | 4.92                      | 11.12               | 1.16                | 1.64               | 1.92             | 21.62                   |
| 9077               | 13.65              | 5.46                    | 4.28                      | 9.74                | .90                 | 1.67               | 2.42             | 20.72                   |
| 9078               | 13.16              | 5.72                    | 4.15                      | 9.87                | .99                 | 1.49               | 1.72             | 19.37                   |
| 9079               | 12.67              | 6.26                    | 3.82                      | 10.08               | .99                 | 1.60               | 2.51             | 21.00                   |
| 9080               | 12.68              | 5.88                    | 3.94                      | 9.82                | .77                 | 1.64               | 1.83             | 20.05                   |
| 9081               | 14.36              | 5.37                    | 5.28                      | 10.65               | .86                 | 1.69               | 1.80             | 21.08                   |
|                    | <b>14.16</b>       | <b>6.39</b>             | <b>3.91</b>               | <b>10.30</b>        | <b>.97</b>          | <b>1.70</b>        | <b>1.92</b>      | <b>20.98</b>            |
|                    |                    | 8.00                    | 1.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.58                   |
| 7979               | 13.53              | 7.85                    | 3.58                      | 11.43               | .49                 | 1.67               | 1.85             | 22.17                   |
|                    |                    | 8.00                    | 1.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.58                   |
| 8089               | 12.77              | 3.04                    | 3.58                      | 6.62                | .49                 | 2.93               | 6.67             | 26.98                   |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 1.00                | 2.50               | 5.00             | 25.15                   |
| 8252               | 4.53               |                         |                           |                     |                     |                    | 17.22            | 19.80                   |
| 9082               | 1.20               |                         |                           |                     |                     |                    | 13.88            | 15.96                   |



| Laboratory Number. | Name of Brand and Manufacturer.                            | Where and from Whom Collected.                                          |
|--------------------|------------------------------------------------------------|-------------------------------------------------------------------------|
| 9083               | S. G. Meridian German Kainit .....                         | W. Rosenbaum, DeKalb.....<br>Average.....<br>Guarantee.....             |
|                    | MISSISSIPPI FERTILIZER CO.,<br>Jackson, Miss.              |                                                                         |
| 8253               | S. G. Acid Phosphate .....                                 | O. S. Moore, Morton.....                                                |
| 9084               | S. G. Acid Phosphate .....                                 | J. B. Pool, Union.....<br>Guarantee.....                                |
| 9085               | S. G. Gerson's Special.....                                | M. Gerson, Collins.....<br>Guarantee.....                               |
| 8016               | S. G. Horseshoe Brand.....                                 | Summers Bros., Morton.....                                              |
| 8017               | S. G. Horseshoe Brand.....                                 | Martin & Burrage, Gallman.....                                          |
| 8207               | S. G. Horseshoe Brand.....                                 | Parsons, May, Oberschmidt & Co.,<br>Brookhaven .....                    |
| 8254               | S. G. Horseshoe Brand.....                                 | J. H. Smith, Florence.....                                              |
| 9086               | S. G. Horseshoe Brand.....                                 | Ruffin Merc. Co., Ellisville.....                                       |
| 9087               | S. G. Horseshoe Brand.....                                 | E. P. Donald & Son, Philadelphia.....<br>Average.....<br>Guarantee..... |
| 8255               | S. G. Improxed Miss. Mixture.....                          | J. A. Spann & Co., Pelahatchie.....                                     |
| 8256               | S. G. Improved Miss. Mixture.....                          | O. S. Moore, Morton.....                                                |
| 9088               | S. G. Improved Miss. Mixture.....                          | C. Atkinson's Sons Co., Summit.....                                     |
| 9089               | S. G. Improved Miss. Mixture.....                          | McCollum & Co., Weathersby.....<br>Average.....<br>Guarantee.....       |
|                    | MT. PLEASANT FERTILIZER<br>COMPANY,<br>Mt. Pleasant, Tenn. |                                                                         |
| 8090               | Big Success H. G. Mt. Pleasant Special Acid Phosphate..... | Donald Bros., New Hebron.....                                           |
| 8298               | Big Success H. G. Mt. Pleasant Special Acid Phosphate..... | W. A. Turner & Co., Forest.....<br>Guarantee.....                       |
| 9090               | S. G. Black Patch Soluble Bone .....                       | F. E. Floyd & Co., Mendenhall.....<br>Guarantee.....                    |
| 8257               | S. G. Big Success Mt. Pleasant Soluble Bone.....           | W. A. Turner & Co., Forest.....<br>Guarantee.....                       |
| 8091               | O. G. Big Success Cotton Grower .....                      | Donald Bros., New Hebron.....                                           |
| 8299               | O. G. Big Success Cotton Grower .....                      | W. G. Barnes, Brandon.....                                              |
| 8300               | O. G. Big Success Cotton Grower .....                      | W. A. Turner & Co., Forest.....<br>Average.....<br>Guarantee.....       |

| Laboratory Number. | Moisture—Per Cent.    | Phosphoric Acid.            |                             |                                |                             | Nitrogen—Per Cent.          | Potash—Per Cent.               | Relative Value Per Ton.          |
|--------------------|-----------------------|-----------------------------|-----------------------------|--------------------------------|-----------------------------|-----------------------------|--------------------------------|----------------------------------|
|                    |                       | Water Soluble Per Cent.     | Citrate Soluble Per Cent.   | Available Per Cent.            | Insoluble Per Cent.         |                             |                                |                                  |
| 9083               | 1.46<br><b>2.39</b>   |                             |                             |                                |                             |                             | 13.04<br><b>14.71</b><br>12.00 | \$15.00<br><b>16.92</b><br>13.80 |
| 8253               | 11.89                 | 7.60                        | 5.11                        | 12.71                          | 1.27                        |                             |                                | 13.47                            |
| 9084               | 10.57                 | 6.91<br>10.00               | 5.44<br>2.00                | 12.35<br>12.00                 | 1.68<br>1.00                |                             |                                | 13.04<br>13.00                   |
| 9085               | 12.46                 | 6.87<br>7.50                | 2.67<br>2.00                | 9.54<br>9.50                   | .55<br>1.00                 | 1.71<br>1.65                | 2.26<br>1.80                   | 20.62<br>19.87                   |
| 8016               | 10.54                 | 6.91                        | 2.46                        | 9.37                           | 1.20                        | 1.67                        | 2.10                           | 20.09                            |
| 8017               | 10.61                 | 7.02                        | 2.30                        | 9.32                           | 1.15                        | 1.68                        | 1.95                           | 19.92                            |
| 8207               | 10.38                 | 6.46                        | 2.32                        | 8.78                           | 1.00                        | 1.64                        | 2.49                           | 19.73                            |
| 8254               | 11.30                 | 6.61                        | 2.65                        | 9.26                           | .64                         | 1.65                        | 2.21                           | 19.99                            |
| 9086               | 11.51                 | 5.83                        | 3.48                        | 9.31                           | .56                         | 1.38                        | 2.04                           | 18.69                            |
| 9087               | 12.37<br><b>11.12</b> | 6.55<br><b>6.56</b><br>7.50 | 2.88<br><b>2.68</b><br>2.00 | 9.43<br><b>9.24</b><br>9.50    | .42<br><b>.83</b><br>1.00   | 1.74<br><b>1.63</b><br>1.65 | 2.47<br><b>2.21</b><br>1.80    | 20.83<br><b>19.88</b><br>19.87   |
| 8255               | 10.86                 | 6.81                        | 2.32                        | 9.13                           | 1.04                        | 1.38                        | 1.97                           | 18.51                            |
| 8256               | 10.45                 | 6.64                        | 2.74                        | 9.38                           | .87                         | 1.49                        | 2.22                           | 19.50                            |
| 9088               | 12.68                 | 6.84                        | 2.80                        | 9.64                           | .46                         | 1.77                        | 1.92                           | 20.58                            |
| 9089               | 13.55<br><b>11.88</b> | 7.14<br><b>6.86</b><br>7.50 | 2.43<br><b>2.57</b><br>2.00 | 9.57<br><b>9.43</b><br>9.50    | .77<br><b>.78</b><br>1.00   | 1.53<br><b>1.54</b><br>1.65 | 1.86<br><b>1.99</b><br>1.80    | 19.50<br><b>19.52</b><br>19.87   |
| 8090               | 12.04                 | 9.86                        | 4.79                        | 14.65                          | 2.67                        |                             |                                | 15.64                            |
| 8298               | 14.08                 | 9.91<br>12.00               | 3.90<br>2.00                | 13.81<br>14.00                 | 2.52<br>2.00                |                             |                                | 14.80<br>15.20                   |
| 9090               | 9.23                  | 9.44<br>10.00               | 5.17<br>2.00                | 14.61<br>12.00                 | 3.22<br>3.00                |                             |                                | 15.55<br>13.00                   |
| 8257               | 10.85                 | 7.64<br>10.00               | 4.32<br>2.00                | 11.96<br>12.00                 | 6.20<br>3.00                |                             |                                | 12.72<br>13.00                   |
| 8091               | 11.37                 | 6.58                        | 3.90                        | 10.48                          | 5.32                        | .86                         | 1.28                           | 17.10                            |
| 8299               | 12.11                 | 5.87                        | 3.94                        | 9.81                           | 5.42                        | .97                         | 1.05                           | 16.47                            |
| 8300               | 11.78<br><b>11.75</b> | 6.59<br><b>6.35</b><br>7.00 | 3.72<br><b>3.85</b><br>3.00 | 10.31<br><b>10.20</b><br>10.00 | 4.62<br><b>5.12</b><br>5.00 | .93<br><b>.92</b><br>.82    | 1.10<br><b>1.14</b><br>1.00    | 16.99<br><b>16.85</b><br>16.13   |

| Laboratory Number. | Name of Brand and Manufacturer.                       | Where and from Whom Collected.                             |
|--------------------|-------------------------------------------------------|------------------------------------------------------------|
| 8258               | S. G. Georgia Electric Cotton Grower .....            | W. A. Turner & Co., Forest.....                            |
| 9091               | S. G. Georgia Electric Cotton Grower .....            | Mars Bros., Philadelphia.....<br>Guarantee.....            |
| 8259               | O. G. North Miss. Cotton Grower .....                 | W. A. Turner & Co., Forest.....<br>Guarantee.....          |
|                    | NEW ORLEANS ACID & FERT. COMPANY,<br>New Orleans, La. |                                                            |
| 8260               | H. G. Acid Phosphate 16%.....                         | Jeweler & Willoughby, Summit.....                          |
| 8330               | H. G. Acid Phosphate 16%.....                         | Hyman Merc. Co., Summit.....<br>Guarantee.....             |
| 8128               | S. G. Black Diamond Acid Phosphate.....               | E. E. Bonner, Sandersville.....                            |
| 9092               | S. G. Black Diamond Acid Phosphate.....               | S. Cohn & Son, Magnolia.....                               |
| 9093               | S. G. Black Diamond Acid Phosphate.....               | K. Green, Shuqualak.....<br>Average.....<br>Guarantee..... |
| 8261               | S. G. Crescent City Acid Phosphate.....               | Philip Didlake, Star.....                                  |
| 9094               | S. G. Crescent City Acid Phosphate.....               | Florence Merc. Co., Florence.....<br>Guarantee.....        |
| 8208               | S. G. Ammoniated R. B. Superphosphate and Potash..... | Dunnagin-Whitaker Co., Laurel.....                         |
| 9095               | S. G. Ammoniated R. B. Superphosphate and Potash..... | Osyka Merc. Co., Osyka.....<br>Guarantee.....              |
| 8129               | S. G. Blood, Bone & Potash .....                      | E. E. Bonner, Sandersville.....                            |
| 8262               | S. G. Blood, Bone & Potash .....                      | Philip Didlake, Star.....<br>Guarantee.....                |
| 9096               | S. G. Dissolved Bone and Potash.....                  | McGough Bros., Morton.....<br>Guarantee.....               |
| 9097               | H. G. Economizer .....                                | Donald Bros., Magee.....                                   |
| 9098               | H. G. Economizer .....                                | W. C. Ellis Co., Magee.....<br>Guarantee.....              |
| 9099               | S. G. Gold Dust.....                                  | Stevens & Ruffin, Richton.....<br>Guarantee.....           |
| 8130               | S. G. Goldsmith's Improved Mixture .....              | E. E. Bonner, Sandersville.....                            |
| 8263               | S. G. Goldsmith's Improved Mixture .....              | Planters Merc. Co., Woodville.....                         |
| 9100               | S. G. Goldsmith's Improved Mixture .....              | Wm. Atkinson & Bacot Co., Osyka....                        |
| 9101               | S. G. Goldsmith's Improved Mixture .....              | J. H. Ervin, Weir.....                                     |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8258               | 10.09              | 5.49                    | 4.57                      | 10.06               | 6.16                |                    | 1.88             | \$13.78                 |
| 9091               | 10.51              | 5.59<br>7.00            | 6.68<br>3.00              | 12.27<br>10.00      | 4.44<br>5.00        |                    | 1.70<br>2.00     | 16.01<br>14.00          |
| 8259               | 11.54              | 6.81<br>7.00            | 3.86<br>3.00              | 10.67<br>10.00      | 3.51<br>5.00        | 1.85<br>1.64       | 1.17<br>1.00     | 21.16<br>19.41          |
| 8260               | 13.69              | 11.54                   | 3.63                      | 15.17               | 1.32                |                    |                  | 16.32                   |
| 8330               | 13.54              | 13.38<br>12.00          | 1.99<br>4.00              | 15.37<br>16.00      | .46<br>2.00         |                    |                  | 16.71<br>17.20          |
| 8128               | 11.20              | 9.29                    | 2.15                      | 11.44               | .15                 |                    |                  | 12.37                   |
| 9092               | 10.31              | 5.78                    | 5.08                      | 10.86               | .49                 |                    |                  | 11.44                   |
| 9093               | 11.21<br>10.91     | 6.83<br>7.30            | 4.58<br>3.94              | 11.41<br>11.24      | .07<br>24           |                    |                  | 12.09<br>11.97          |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    |                  | 13.00                   |
| 8261               | 12.37              | 8.97                    | 3.09                      | 12.06               | .15                 |                    |                  | 12.96                   |
| 9094               | 15.39              | 6.36<br>10.00           | 6.12<br>2.00              | 12.48<br>12.00      | .20<br>2.00         |                    |                  | 13.12<br>13.00          |
| 8208               | 10.49              | 6.03                    | 2.43                      | 8.46                | .13                 | 1.82               | 1.80             | 19.26                   |
| 9095               | 13.24              | 3.54<br>7.00            | 2.92<br>2.00              | 6.46<br>9.00        | .20<br>2.00         | 1.47<br>1.65       | 1.29<br>1.50     | 14.82<br>18.93          |
| 8129               | 10.75              | 6.93                    | 2.20                      | 9.13                | .09                 | 1.55               | 1.70             | 18.89                   |
| 8262               | 11.76              | 6.23<br>7.00            | 2.39<br>2.00              | 8.62<br>9.00        | .09<br>2.00         | 1.67<br>1.65       | 1.51<br>1.50     | 18.52<br>18.93          |
| 9096               | 10.52              | 5.99<br>8.00            | 4.47<br>2.00              | 10.46<br>10.00      | .32<br>2.00         |                    | 1.33<br>2.00     | 13.63<br>14.10          |
| 9097               | 12.78              | 5.55                    | 3.52                      | 9.07                | .45                 | 1.85               | 2.06             | 20.30                   |
| 9098               | 14.79              | 6.60<br>8.00            | 3.64<br>2.00              | 10.24<br>10.00      | .49<br>2.00         | 1.56<br>1.65       | 1.52<br>2.00     | 19.91<br>20.70          |
| 9099               | 13.09              | 5.67<br>7.00            | 4.24<br>2.00              | 9.91<br>9.00        | .46<br>2.00         | 1.23<br>1.65       | 1.64<br>1.50     | 18.27<br>18.93          |
| 8130               | 13.50              | 7.05                    | 2.62                      | 9.67                | 1.05                | 1.63               | 1.84             | 19.98                   |
| 8263               | 12.49              | 7.23                    | 2.17                      | 9.40                | .19                 | 1.75               | 1.62             | 19.93                   |
| 9100               | 15.15              | 4.44                    | 3.03                      | 7.47                | .40                 | 1.58               | 1.54             | 16.75                   |
| 9101               | 13.96              | 6.12                    | 4.39                      | 10.51               | .43                 | 1.27               | 1.52             | 19.00                   |



| Laboratory Number. | Name of Brand and Manufacturer.                                       | Where and from Whom Collected.                                     |
|--------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------|
| 9102               | S. G. Goldsmith's Improved Mixture .....                              | Loper Merc. Co., Lake.....<br>Average.....<br>Guarantee.....       |
| 9103               | S. G. German Kainit.....<br>NEWTON OIL & M'F'G. Co.,<br>Newton, Miss. | Osyka Merc. Co., Osyka.....<br>Guarantee.....                      |
| 9104               | H. G. Acid Phosphate .....                                            | J. B. Stewart, Philadelphia.....                                   |
| 9105               | H. G. Acid Phosphate .....                                            | M. A. Metts, Louisville.....<br>Guarantee.....                     |
| 7949               | S. G. Acid Phosphate .....                                            | Newton Oil & M'f'g. Co., Newton.....                               |
| 9106               | S. G. Acid Phosphate .....                                            | Summers Bros., Morton.....                                         |
| 9107               | S. G. Acid Phosphate .....                                            | J. T. Hunter, Decatur.....<br>Average.....<br>Guarantee.....       |
| 7950               | S. G. Banner C. & C. Brand ..                                         | Newton Oil & Mfg. Co., Newton.....                                 |
| 8052               | S. G. Banner C. & C. Brand ..                                         | Beamman & Co., Forest.....                                         |
| 9108               | S. G. Banner C. & C. Brand ..                                         | McMullan & Sons, Hickory.....                                      |
| 9109               | S. G. Banner C. & C. Brand ..                                         | J. T. Lewis, Neshoba.....                                          |
| 9110               | S. G. Banner C. & C. Brand ..                                         | J. B. Stewart, Philadelphia.....<br>Average.....<br>Guarantee..... |
|                    | PLANTERS FERTILIZER &<br>CHEMICAL COMPANY,<br>New Orleans, La.        |                                                                    |
| 8264               | S. G. Planters Acid Phos. ....                                        | M. H. Rothschild, Woodville.....<br>Guarantee.....                 |
| 9111               | S. G. Planters Cotton &<br>Corn No. 1 .....                           | Davis Bros., Ocean Springs.....<br>Guarantee.....                  |
| 8265               | S. G. Planters Golden Mixt. ...                                       | S. Cohn & Sons, Peoria.....                                        |
| 9112               | S. G. Planters Golden Mixt. ...                                       | Robinson Merc. Co., Centreville.....<br>Guarantee.....             |
| 8266               | S. G. Planters R. B. Super-<br>phosphate .....                        | S. Cohn & Sons, Peoria.....                                        |
| 9113               | S. G. Planters R. B. Sup-<br>phosphate .....                          | C. Atkinson's Sons Co., Summit.....<br>Guarantee.....              |
|                    | REFUGE COTTON OIL Co.,<br>Columbus, Miss.                             |                                                                    |
| 7951               | Refuge H. G. Acid Phosphate                                           | Refuge Cotton Oil Co., Columbus.....                               |
| 9114               | Refuge H. G. Acid Phosphate                                           | W. D. Miller, Louisville.....                                      |
| 9115               | Refuge H. G. Acid Phosphate                                           | J. A. Mayfield, Amory.....<br>Average.....<br>Guarantee.....       |
| 7952               | S. G. Columbus Home Made<br>Fertilizer.....                           | Refuge Cotton Oil Co., Columbus.....                               |
| 8209               | S. G. Columbus Home Made<br>Fertilizer.....                           | Eupora Farmers Union Warehouse<br>Co., Eupora.....                 |

| Laboratory Number. | Moisture—Per Cent.             | Phosphoric Acid.            |                             |                                |                            | Nitrogen—Per Cent.          | Potash—Per Cent.            | Relative Value Per Ton.          |
|--------------------|--------------------------------|-----------------------------|-----------------------------|--------------------------------|----------------------------|-----------------------------|-----------------------------|----------------------------------|
|                    |                                | Water Soluble Per Cent.     | Citrate Soluble Per Cent.   | Available Per Cent.            | Insoluble Per Cent.        |                             |                             |                                  |
| 9102               | 13.33<br><b>13.68</b>          | 6.10<br><b>6.19</b><br>7.00 | 3.88<br><b>3.21</b><br>2.00 | 9.98<br><b>9.40</b><br>9.00    | .58<br><b>.53</b><br>2.00  | 1.55<br><b>1.56</b><br>1.65 | 1.61<br><b>1.62</b><br>1.50 | \$19.64<br><b>19.06</b><br>18.93 |
| 9103               | 1.40                           |                             |                             |                                |                            |                             | 13.04<br>12.00              | 15.00<br>13.80                   |
| 9104               | 12.57                          | 8.06                        | 6.33                        | 14.39                          | .96                        |                             |                             | 15.20                            |
| 9105               | 13.41                          | 7.55<br>12.00               | 7.11<br>2.00                | 14.66<br>14.00                 | .58<br>1.00                |                             |                             | 15.42<br>15.20                   |
| 7949               | 13.05                          | 9.43                        | 4.19                        | 13.62                          | 1.37                       |                             |                             | 14.56                            |
| 9106               | 9.82                           | 5.88                        | 6.84                        | 12.72                          | 1.25                       |                             |                             | 13.31                            |
| 9107               | 12.63<br><b>11.83</b><br>10.00 | 5.55<br><b>6.95</b><br>2.00 | 8.57<br><b>6.53</b><br>2.00 | 14.12<br><b>13.48</b><br>12.00 | .87<br><b>1.16</b><br>1.00 |                             |                             | 14.68<br><b>14.18</b><br>13.00   |
| 7950               | 11.66                          | 6.74                        | 2.86                        | 9.60                           | .87                        | 1.63                        | 2.26                        | 20.45                            |
| 8052               | 10.92                          | 6.86                        | 3.09                        | 9.95                           | 1.18                       | 1.68                        | 1.47                        | 20.04                            |
| 9108               | 12.02                          | 5.26                        | 4.46                        | 9.72                           | .52                        | 1.19                        | 2.41                        | 18.75                            |
| 9109               | 11.21                          | 6.12                        | 2.83                        | 8.95                           | .65                        | 1.34                        | 2.36                        | 18.53                            |
| 9110               | 11.86<br><b>11.53</b><br>7.00  | 5.10<br><b>6.02</b><br>1.50 | 3.36<br><b>3.32</b><br>1.50 | 8.46<br><b>9.34</b><br>8.50    | .51<br><b>.75</b><br>1.00  | 1.45<br><b>1.46</b><br>1.65 | 2.76<br><b>2.25</b><br>2.25 | 18.79<br><b>19.31</b><br>19.24   |
| 8264               | 17.94                          | 9.04<br>10.00               | 3.95<br>2.00                | 12.99<br>12.00                 | 1.92<br>2.00               |                             |                             | 13.89<br>13.00                   |
| 9111               | 14.96                          | 6.60<br>7.00                | 4.13<br>2.50                | 10.73<br>9.50                  | 2.74<br>2.00               | 1.14<br>1.65                | 1.56<br>1.50                | 18.82<br>19.48                   |
| 8265               | 14.96                          | 6.65                        | 2.97                        | 9.62                           | 1.85                       | 1.92                        | 1.26                        | 20.38                            |
| 9112               | 14.15                          | 5.68<br>7.00                | 3.80<br>2.50                | 9.48<br>9.50                   | .77<br>2.00                | 1.69<br>1.65                | 1.45<br>1.50                | 19.42<br>19.48                   |
| 8266               | 16.36                          | 6.52                        | 2.54                        | 9.06                           | 1.56                       | 1.69                        | 1.21                        | 18.77                            |
| 9113               | 12.78                          | 4.96<br>7.00                | 4.55<br>2.50                | 9.51<br>9.50                   | 1.80<br>2.00               | 1.86<br>1.65                | 1.22<br>1.50                | 19.80<br>19.48                   |
| 7951               | 10.44                          | 7.82                        | 6.75                        | 14.57                          | .42                        |                             |                             | 15.35                            |
| 9114               | 14.60                          | 8.53                        | 5.25                        | 13.78                          | 1.70                       |                             |                             | 14.63                            |
| 9115               | 14.42<br><b>13.15</b><br>12.00 | 8.37<br><b>8.24</b><br>2.00 | 7.05<br><b>6.35</b><br>2.00 | 15.42<br><b>14.59</b><br>14.00 | .58<br><b>.90</b><br>2.00  |                             |                             | 16.26<br><b>15.41</b><br>15.20   |
| 7952               | 9.49                           | 5.05                        | 4.64                        | 9.69                           | .74                        | 1.53                        | 2.11                        | 19.71                            |
| 8209               | 12.17                          | 6.06                        | 3.34                        | 9.40                           | 1.51                       | 1.75                        | 2.08                        | 20.34                            |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                                  |
|--------------------|----------------------------------------------------------|-----------------------------------------------------------------|
| 8267               | S. G. Columbus Home Made Fertilizer.....                 | Cleveland Bros., Union.....                                     |
| 8331               | S. G. Columbus Home Made Fertilizer.....                 | J. D. McKellar, New Hope.....                                   |
| 9116               | S. G. Columbus Home Made Fertilizer.....                 | Carrollton Hdw. & Imp. Co., Carrollton                          |
| 9117               | S. G. Columbus Home Made Fertilizer.....                 | J. E. Nunnery, Lauderdale.....                                  |
| 9118               | S. G. Columbus Home Made Fertilizer.....                 | J. T. McClure, Shuqualak.....<br>Average.....<br>Guarantee..... |
| 7953               | S. G. Sandy Land Special Fertilizer.....                 | Refuge Cotton Oil Co., Columbus.....                            |
| 8268               | S. G. Sandy Land Special Fertilizer.....                 | Cleveland Bros., Union.....                                     |
| 9119               | S. G. Sandy Land Special Fertilizer.....                 | A. B. Norris, West Point.....<br>Average.....<br>Guarantee..... |
|                    | SHUBUTA OIL & M'F'G. Co.,<br>Shubuta, Miss.              |                                                                 |
| 8269               | Shubuta H. G. Acid Phos.....                             | Shubuta Oil & Mfg. Co., Shubuta.....                            |
| 9120               | Shubuta H. G. Acid Phos.....                             | W. P. Hodges, DeSoto.....<br>Guarantee.....                     |
| 8270               | S. G. Shubuta Mixture .....                              | Shubuta Oil & Mfg. Co., Shubuta.....<br>Guarantee.....          |
| 8210               | S. G. German Kainit.....                                 | Shubuta Oil & Mfg. Co., Shubuta.....<br>Guarantee.....          |
|                    | SOUTHERN OIL & FERTILIZER<br>COMPANY,<br>Meridian, Miss. |                                                                 |
| 8053               | Southern's 20th Century H.G.<br>Acid Phosphate .....     | Southern Oil & Fert. Co., Meridian...                           |
| 9121               | Southern's 20th Century H.G.<br>Acid Phosphate .....     | Meyer Bros., Meridian.....<br>Guarantee.....                    |
| 8131               | Southern's S. G. Acid Phos. ..                           | Farmers Un. Warehouse Co., Ellisville                           |
| 9122               | Southern's S. G. Acid Phos. ..                           | J. D. Pigford, Tonic.....<br>Guarantee.....                     |
| 8054               | Southern's S. G. Cot. Grower                             | Winner, Klein & Co., Meridian.....                              |
| 9123               | Southern's S. G. Cot. Grower                             | E. T. Bounds, Vossburg.....                                     |
| 9124               | Southern's S. G. Cot. Grower                             | Gayden & Co., Brandon.....                                      |
| 9125               | Southern's S. G. Cot. Grower                             | Dorsett & Co., Richton.....<br>Average.....<br>Guarantee.....   |
| 8132               | Southern's S. G. Superior<br>Mixture .....               | J. A. Taylor & Son, Pelahatchie.....<br>Guarantee.....          |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8267               | 12.00              | 5.58                    | 3.47                      | 9.05                | 1.10                | 1.50               | 1.89             | \$18.69                 |
| 8331               | 11.81              | 6.22                    | 3.99                      | 10.21               | 1.36                | 1.61               | 1.77             | 20.33                   |
| 9116               | 11.94              | 6.20                    | 3.19                      | 9.39                | .86                 | 1.94               | 1.88             | 20.87                   |
| 9117               | 12.43              | 5.30                    | 3.87                      | 9.17                | .81                 | 1.68               | 1.91             | 19.53                   |
| 9118               | 11.51              | 6.31                    | 3.42                      | 9.73                | .73                 | 1.61               | 1.94             | 20.01                   |
|                    | <b>11.62</b>       | <b>5.82</b>             | <b>3.70</b>               | <b>9.52</b>         | <b>1.01</b>         | <b>1.66</b>        | <b>1.94</b>      | <b>19.93</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.13                   |
| 7953               | 8.65               | 3.81                    | 3.40                      | 7.21                | .28                 | 1.64               | 4.24             | 19.75                   |
| 8268               | 8.67               | 4.09                    | 3.62                      | 7.71                | .18                 | 1.74               | 3.58             | 19.97                   |
| 9119               | 13.51              | 5.09                    | 3.40                      | 8.49                | 1.04                | 1.83               | 2.38             | 19.91                   |
|                    | <b>10.25</b>       | <b>4.33</b>             | <b>3.47</b>               | <b>7.80</b>         | <b>.50</b>          | <b>1.74</b>        | <b>3.40</b>      | <b>19.98</b>            |
|                    |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | 1.65               | 4.00             | 19.40                   |
| 8269               | 16.88              | 8.64                    | 2.85                      | 11.49               | 2.62                |                    |                  | 12.35                   |
| 9120               | 14.94              | 7.97                    | 5.13                      | 13.10               | .73                 |                    |                  | 13.90                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 1.00                |                    |                  | 15.00                   |
| 8270               | 12.44              | 5.92                    | 2.63                      | 8.55                | 1.28                | 1.70               | 2.06             | 19.17                   |
|                    |                    | 6.00                    | 3.00                      | 9.00                | 1.00                | 1.65               | 1.60             | 18.94                   |
| 8210               | 3.01               |                         |                           |                     |                     |                    | 12.04            | 13.85                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
| 8053               | 13.53              | 9.68                    | 3.30                      | 12.98               | 2.32                |                    |                  | 13.95                   |
| 9121               | 11.52              | 6.51                    | 7.85                      | 14.36               | 1.70                |                    |                  | 15.01                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 8131               | 13.55              | 8.61                    | 4.56                      | 13.17               | 1.89                |                    |                  | 14.03                   |
| 9122               | 15.32              | 7.60                    | 7.29                      | 14.89               | .84                 |                    |                  | 15.65                   |
|                    |                    | 9.00                    | 3.00                      | 12.00               | 2.00                |                    |                  | 12.90                   |
| 8054               | 12.07              | 7.16                    | 2.57                      | 9.73                | 1.59                | 1.46               | 1.97             | 19.42                   |
| 9123               | 12.96              | 6.18                    | 4.07                      | 10.25               | .84                 | 1.66               | 1.38             | 20.12                   |
| 9124               | 10.87              | 5.07                    | 3.40                      | 8.47                | .69                 | 2.04               | 2.03             | 20.32                   |
| 9125               | 10.60              | 6.00                    | 3.99                      | 9.99                | .41                 | 1.59               | 2.03             | 20.28                   |
|                    | <b>11.63</b>       | <b>6.10</b>             | <b>3.51</b>               | <b>9.61</b>         | <b>.88</b>          | <b>1.68</b>        | <b>1.85</b>      | <b>20.03</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 2.00             | 19.50                   |
| 8132               | 11.78              | 5.59                    | 3.16                      | 8.75                | 1.67                | 1.66               | 1.99             | 19.11                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 2.00             | 19.50                   |



TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                               | Where and from Whom Collected.                                          |
|--------------------|---------------------------------------------------------------|-------------------------------------------------------------------------|
|                    | STANDARD GUANO & CHEM.<br>M'F'G. COMPANY,<br>New Orleans, La. |                                                                         |
| 9126               | H. G. Stern's Acid Phosphate<br>16%                           | Wm. Atkinson-Bacot Co., Osyka.....                                      |
| 9127               | H. G. Stern's Acid Phosphate<br>16%                           | J. L. Moyse & Bro., Summit.....                                         |
| 9128               | H. G. Stern's Acid Phosphate<br>16%                           | Lampton Merc. Co., Magnolia.....<br>Average.....<br>Guarantee.....      |
| 9129               | H. G. Stern's Acid Phosphate                                  | Watts Merc. Co., Sandersville.....                                      |
| 9130               | H. G. Stern's Acid Phosphate                                  | D. C. Griffith & Co., Silver Creek.....<br>Guarantee.....               |
| 9131               | S. G. Blood, Bone and Meat                                    | Osyka Merc. Co., Osyka.....                                             |
| 9132               | S. G. Blood, Bone and Meat                                    | R. L. Berry & Bro., Prentiss.....<br>Guarantee.....                     |
| 8092               | S. G. Miss. Home Guano .....                                  | R. L. Berry & Bro., Prentiss.....                                       |
| 8093               | S. G. Miss. Home Guano .....                                  | Rankin & Co., Columbia.....                                             |
| 9133               | S. G. Miss. Home Guano .....                                  | L. C. Smith, Lauderdale.....                                            |
| 9134               | S. G. Miss. Home Guano .....                                  | J. M. Kelley, Gandsi.....                                               |
| 9135               | S. G. Miss. Home Guano .....                                  | Rouse Bros. & Smith, Poplarville.....                                   |
| 9136               | S. G. Miss. Home Guano .....                                  | S. Bernheimer & Son, Port Gibson.....<br>Average.....<br>Guarantee..... |
| 8094               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Rankin & Co., Columbia.....                                             |
| 8095               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | J. E. McNair, Lumberton.....                                            |
| 8096               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | R. L. Berry & Bro., Prentiss.....                                       |
| 8133               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Rawls Lampton & Co., Silver Creek....                                   |
| 8134               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Hawkins, McRaney Co., Bassfield.....                                    |
| 8211               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Abron Bros., Brookhaven.....                                            |
| 9137               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Mills-Guy Co., McComb City.....                                         |
| 9138               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Wise Merc. Co., Hazlehurst.....                                         |
| 9139               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | Wm. Atkinson & Bacot Co., Osyka....                                     |
| 9140               | S. G. Stern's Am. R. B.<br>Superphosphate .....               | F. L. Riley Merc. Co., New Hebron....<br>Average.....<br>Guarantee..... |
| 9141               | S. G. German Kainit.....                                      | Walton & Co., Aberdeen.....                                             |
| 9142               | S. G. German Kainit.....                                      | Davis Bros., Ocean Springs.....<br>Guarantee.....                       |

| Laboratory Number. | Moisture—Per Cent.    | Phosphoric Acid.                      |                                    |                                       |                                    | Nitrogen—Per Cent.                 | Potash—Per Cent.                   | Relative Value Per Ton.               |
|--------------------|-----------------------|---------------------------------------|------------------------------------|---------------------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------------|
|                    |                       | Water Soluble Per Cent.               | Citrate Soluble Per Cent.          | Available Per Cent.                   | Insoluble Per Cent.                |                                    |                                    |                                       |
| 9126               | 18.30                 | 12.28                                 | 3.49                               | 15.77                                 | .38                                |                                    |                                    | \$17.00                               |
| 9127               | 18.06                 | 12.88                                 | 2.51                               | 15.39                                 | .87                                |                                    |                                    | 16.68                                 |
| 9128               | 15.31<br><b>17.22</b> | 12.14<br><b>12.43</b><br><i>14.00</i> | 3.29<br><b>3.10</b><br><i>2.00</i> | 15.43<br><b>15.53</b><br><i>16.00</i> | .93<br><b>.73</b><br><i>1.00</i>   |                                    |                                    | 16.64<br><b>16.77</b><br><i>17.40</i> |
| 9129               | 17.76                 | 9.83                                  | 3.33                               | 13.16                                 | 2.46                               |                                    |                                    | 14.14                                 |
| 9130               | 16.25                 | 7.85<br><i>12.00</i>                  | 6.01<br><i>2.00</i>                | 13.86<br><i>14.00</i>                 | 2.30<br><i>1.00</i>                |                                    |                                    | 14.65<br><i>15.20</i>                 |
| 9131               | 15.13                 | 5.85                                  | 5.23                               | 11.08                                 | 1.23                               | 1.70                               | 1.51                               | 21.31                                 |
| 9132               | 15.54                 | 6.60<br><i>7.00</i>                   | 3.26<br><i>2.50</i>                | 9.86<br><i>9.50</i>                   | 1.28<br><i>1.00</i>                | 1.67<br><i>1.65</i>                | 1.51<br><i>1.50</i>                | 19.92<br><i>19.48</i>                 |
| 8092               | 14.07                 | 6.88                                  | 2.75                               | 9.63                                  | 1.41                               | 1.53                               | 2.22                               | 19.95                                 |
| 8093               | 14.48                 | 7.32                                  | 2.41                               | 9.73                                  | 1.41                               | 1.63                               | 1.93                               | 20.17                                 |
| 9133               | 14.29                 | 7.14                                  | 3.55                               | 10.69                                 | .83                                | 1.67                               | 1.71                               | 21.12                                 |
| 9134               | 10.08                 | 7.56                                  | 2.96                               | 10.52                                 | 1.42                               | 1.49                               | 1.95                               | 20.53                                 |
| 9135               | 14.41                 | 6.95                                  | 3.25                               | 10.21                                 | 1.02                               | 1.75                               | 1.60                               | 20.76                                 |
| 9136               | 14.92<br><b>13.71</b> | 7.37<br><b>7.20</b><br><i>7.00</i>    | 3.32<br><b>3.04</b><br><i>2.50</i> | 10.69<br><b>10.24</b><br><i>9.50</i>  | 1.46<br><b>1.26</b><br><i>1.00</i> | 1.60<br><b>1.61</b><br><i>1.65</i> | 2.04<br><b>1.91</b><br><i>1.50</i> | 21.24<br><b>20.62</b><br><i>19.48</i> |
| 8094               | 15.50                 | 7.24                                  | 3.06                               | 10.30                                 | 1.10                               | 1.70                               | 1.85                               | 20.98                                 |
| 8095               | 15.01                 | 7.18                                  | 3.25                               | 10.43                                 | .78                                | 1.76                               | 1.79                               | 21.29                                 |
| 8096               | 14.99                 | 7.20                                  | 3.48                               | 10.68                                 | .74                                | 2.03                               | 1.84                               | 22.70                                 |
| 8133               | 15.56                 | 5.50                                  | 4.49                               | 9.99                                  | 1.27                               | 1.88                               | 1.93                               | 21.28                                 |
| 8134               | 15.00                 | 5.64                                  | 4.19                               | 9.83                                  | 1.41                               | 1.89                               | 1.87                               | 21.09                                 |
| 8211               | 15.14                 | 5.14                                  | 4.76                               | 9.90                                  | 1.23                               | 1.82                               | 1.82                               | 20.78                                 |
| 9137               | 15.67                 | 4.93                                  | 4.58                               | 9.51                                  | 1.57                               | 1.83                               | 1.56                               | 20.07                                 |
| 9138               | 15.46                 | 5.28                                  | 5.06                               | 10.34                                 | 1.10                               | 1.61                               | 1.56                               | 20.14                                 |
| 9139               | 16.22                 | 5.77                                  | 4.53                               | 10.30                                 | 1.10                               | 1.68                               | 1.63                               | 20.50                                 |
| 9140               | 17.21<br><b>15.58</b> | 4.49<br><b>5.83</b><br><i>7.00</i>    | 4.95<br><b>4.24</b><br><i>2.50</i> | 9.44<br><b>10.07</b><br><i>9.50</i>   | 1.62<br><b>1.19</b><br><i>1.00</i> | 1.72<br><b>1.79</b><br><i>1.65</i> | 1.68<br><b>1.76</b><br><i>1.50</i> | 19.65<br><b>20.84</b><br><i>19.48</i> |
| 9141               | .55                   |                                       |                                    |                                       |                                    |                                    | 13.90                              | 15.99                                 |
| 9142               | .46                   |                                       |                                    |                                       |                                    |                                    | 13.82<br><i>12.00</i>              | 15.89<br><i>13.80</i>                 |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                      | Where and from Whom Collected.                                       |
|--------------------|------------------------------------------------------|----------------------------------------------------------------------|
|                    | SWIFT FERTILIZER WORKS,<br>Atlanta, Ga.              |                                                                      |
| 8038               | H. G. Swift's Bone Meal .....                        | Atkinson & McDonald Co., Wesson....<br>Guarantee.....                |
| 8271               | Swift's Cotton Plant S. G.<br>Guano .....            | Williams, Brook Co., Union.....                                      |
| 9143               | Swift's Cotton Plant S. G.<br>Guano .....            | Johnson-Hand Co., Ellisville.....<br>Guarantee.....                  |
| 8170               | Swift's Golden Harvest S. G.<br>Guano .....          | Planters Merc. Co., Baldwyn.....<br>Guarantee.....                   |
| 8272               | Swift's Red Steer S. G.<br>Guano .....               | Williams, Brook Co., Union.....                                      |
| 9144               | Swift's Red Steer S. G.<br>Guano .....               | E. C. Porter, Roxie.....<br>Guarantee.....                           |
|                    | TENNESSEE CHEMICAL CO.,<br>Nashville, Tenn.          |                                                                      |
| 9145               | Ox H. G. Dissolved Bone .....                        | J. D. McKellar, New Hope.....<br>Guarantee.....                      |
| 9146               | Ox S. G. Cotton Guano .....                          | H. B. Vaughn, Steens.....<br>Guarantee.....                          |
| 9147               | Ox S. G. Slaughter House<br>Bone .....               | R. L. Mathis, Corinth.....<br>Guarantee.....                         |
|                    | TENNESSEE VALLEY FERT.<br>COMPANY,<br>Florence, Ala. |                                                                      |
| 8171               | S. G. King Cotton Grower .....                       | F. H. Matthews, Baldwyn.....                                         |
| 9148               | S. G. King Cotton Grower .....                       | Farmers Union, Iuka.....                                             |
| 9149               | S. G. King Cotton Grower .....                       | C. W. McClean, TomNolen.....                                         |
| 9150               | S. G. King Cotton Grower .....                       | W. C. Hindes & Sons, Guntown.....<br>Average.....<br>Guarantee ..... |
|                    | THREEFOOT BROS. & Co.,<br>Meridian, Miss.            |                                                                      |
| 8055               | Threefoot's H. G. English<br>Acid Phosphate .....    | Threefoot Bros. & Co., Meridian.....                                 |
| 9151               | Threefoot's H. G. English<br>Acid Phosphate .....    | Henderson-Molpus Co., Philadelphia                                   |
| 9152               | Threefoot's H. G. English<br>Acid Phosphate .....    | W. Rosenbaum, DeKalb.....<br>Average.....<br>Guarantee .....         |
| 8056               | Threefoot's S. G. Improved<br>Mixture .....          | Threefoot Bros. & Co., Meridian.....                                 |
| 9153               | Threefoot's S. G. Improved<br>Mixture .....          | Henderson-Molpus Co., Philadelphia                                   |

| Laboratory Number. | Moisture—Per Cent.    | Phosphoric Acid.               |                             |                                |                           | Nitrogen—Per Cent.  | Potash—Per Cent.    | Relative Value Per Ton.        |
|--------------------|-----------------------|--------------------------------|-----------------------------|--------------------------------|---------------------------|---------------------|---------------------|--------------------------------|
|                    |                       | Water Soluble Per Cent.        | Citrate Soluble Per Cent.   | Available Per Cent.            | Insoluble Per Cent.       |                     |                     |                                |
| 8038               | 5.74                  |                                |                             |                                | 27.10<br>25.00            | 2.31<br>2.49        |                     | \$22.79<br>22.46               |
| 8271               | 7.96                  | 5.05                           | 4.47                        | 9.52                           | 1.43                      | 1.62                | 1.23                | 18.87                          |
| 9143               | 7.67                  | 3.81<br>6.00                   | 6.15<br>3.00                | 9.96<br>9.00                   | .67<br>1.50               | 1.17<br>1.65        | 1.17<br>1.00        | 17.36<br>18.25                 |
| 8170               | 9.96                  | 5.36<br>5.50                   | 3.27<br>2.50                | 8.63<br>8.00                   | 1.39<br>1.50              | 1.63<br>1.65        | 1.73<br>2.00        | 18.54<br>18.25                 |
| 8272               | 7.68                  | 4.55                           | 3.66                        | 8.21                           | 1.60                      | 1.63                | 1.79                | 18.06                          |
| 9144               | 10.23                 | 3.20<br>5.50                   | 5.18<br>2.50                | 8.38<br>8.00                   | 1.06<br>1.50              | 1.62<br>1.65        | 1.52<br>2.00        | 17.77<br>18.25                 |
| 9145               | 13.03                 | 8.24<br>8.00                   | 5.98<br>6.00                | 14.22<br>14.00                 | 1.47<br>1.00              |                     |                     | 15.04<br>14.80                 |
| 9146               | 15.19                 | 7.93<br>6.00                   | 2.49<br>4.00                | 10.42<br>10.00                 | 1.56<br>1.00              | .96<br>1.65         | 1.74<br>1.00        | 18.10<br>19.35                 |
| 9147               | 12.13                 | 6.92<br>5.00                   | 3.97<br>3.00                | 10.89<br>8.00                  | 1.14<br>1.00              | 1.78<br>1.65        | 2.10<br>2.00        | 22.21<br>18.11                 |
| 8171               | 16.21                 | 6.47                           | 2.68                        | 9.15                           | 3.21                      | 1.50                | 2.97                | 20.13                          |
| 9148               | 16.02                 | 5.31                           | 5.18                        | 10.49                          | 1.56                      | 1.16                | 1.13                | 18.01                          |
| 9149               | 16.62                 | 6.70                           | 3.27                        | 9.97                           | 2.84                      | 1.18                | 2.53                | 19.27                          |
| 9150               | 15.77                 | 6.37                           | 3.41                        | 9.78                           | 2.24                      | 1.19                | 2.28                | 18.78                          |
|                    | <b>16.16</b>          | <b>6.21</b><br>7.00            | <b>3.64</b><br>2.00         | <b>9.85</b><br>9.00            | <b>2.46</b><br>2.00       | <b>1.26</b><br>1.65 | <b>2.22</b><br>1.00 | <b>19.05</b><br>18.35          |
| 8055               | 15.78                 | 10.63                          | 4.28                        | 14.91                          | .80                       |                     |                     | 15.97                          |
| 9151               | 15.35                 | 10.63                          | 4.84                        | 15.47                          | 1.01                      |                     |                     | 16.53                          |
| 9152               | 13.95<br><b>15.03</b> | 10.66<br><b>10.64</b><br>13.00 | 4.95<br><b>4.69</b><br>2.00 | 15.61<br><b>15.33</b><br>15.00 | .64<br><b>.82</b><br>1.00 |                     |                     | 16.68<br><b>16.39</b><br>16.30 |
| 8056               | 8.93                  | 6.90                           | 3.64                        | 10.54                          | 2.06                      | 1.65                | 1.74                | 20.89                          |
| 9153               | 15.93                 | 6.72                           | 4.19                        | 10.91                          | .56                       | 1.68                | 1.65                | 21.29                          |



| Laboratory Number. | Name of Brand and Manufacturer.                       | Where and from Whom Collected.                                             |
|--------------------|-------------------------------------------------------|----------------------------------------------------------------------------|
| 9154               | Threefoot's S. G. Improved Mixture .....              | Threefoot Bros. & Co., Meridian.....<br>Average.....<br>Guarantee.....     |
|                    | TUPELO FERTILIZER FACTORY,<br>Tupelo, Miss.           |                                                                            |
| 7954               | H. G. Cot. Belt Acid Phos. ....                       | J. D. Shaw, Louisville.....                                                |
| 7955               | H. G. Cot. Belt Acid Phos. ....                       | Mott Bros., Union.....                                                     |
| 8172               | H. G. Cot. Belt Acid Phos. ....                       | Bramlitt Hardware Co., Corinth.....                                        |
| 8173               | H. G. Cot. Belt Acid Phos. ....                       | Nettleton Supply Co., Nettleton.....                                       |
| 8332               | H. G. Cot. Belt Acid Phos. ....                       | A. J. Sanders, Steens.....                                                 |
| 9155               | H. G. Cot. Belt Acid Phos. ....                       | Gilmore & May Co., Amory.....                                              |
| 9156               | H. G. Cot. Belt Acid Phos. ....                       | L. C. Smith, Lauderdale.....<br>Average.....<br>Guarantee.....             |
| 9157               | H. G. Levi Philip's Acid Phosphate.....               | Phillips, Reinhart, Taylor & Co.,<br>Booneville.....<br>Guarantee.....     |
| 8174               | H. G. Tupelo Acid Phos. ....                          | W. G. Frances, Nettleton.....<br>Guarantee.....                            |
| 7956               | S. G. Cotton Belt Blood & Bone .....                  | Mott Bros., Union.....                                                     |
| 8175               | S. G. Cotton Belt Blood & Bone .....                  | Baldwyn Supply Co., Baldwyn.....<br>Guarantee.....                         |
| 7957               | S. G. Cotton Belt Fertilizer .....                    | A. Dewesse & Co., Philadelphia.....                                        |
| 7958               | S. G. Cotton Belt Fertilizer .....                    | J. D. Shaw, Louisville.....                                                |
| 8135               | S. G. Cotton Belt Fertilizer.....                     | C. T. Bonney, Enterprise.....                                              |
| 8176               | S. G. Cotton Belt Fertilizer.....                     | Barrett Supply Co., Booneville.....                                        |
| 8177               | S. G. Cotton Belt Fertilizer.....                     | Gilmore & May Co., Amory.....                                              |
| 9158               | S. G. Cotton Belt Fertilizer.....                     | W. L. Witty & Son Co., Winona.....                                         |
| 9159               | S. G. Cotton Belt Fertilizer.....                     | W. H. Stuart, Scooba.....                                                  |
| 9160               | S. G. Cotton Belt Fertilizer.....                     | Bayard-Logan Co., Oxford.....                                              |
| 9161               | S. G. Cotton Belt Fertilizer.....                     | Bramlitt Hardware Co., Corinth .....                                       |
|                    |                                                       | Average.....<br>Guarantee.....                                             |
| 9162               | S. G. Levi Phillip's Mixture.....                     | Phillips, Reinhart, Taylor & Company,<br>Booneville.....<br>Guarantee..... |
|                    | VIRGINIA-CAROLINA CHEMICAL COMPANY,<br>Memphis, Tenn. |                                                                            |
| 7959               | S. G. I. X. L. Acid Phos. ....                        | Mars Bros., Philadelphia.....                                              |
| 8136               | S. G. I. X. L. Acid Phos. ....                        | T. H. Deas, Enterprise.....                                                |
| 8178               | S. G. I. X. L. Acid Phos. ....                        | A. M. Green, Amory.....                                                    |
| 9163               | S. G. I. X. L. Acid Phos. ....                        | J. N. Mullen & Co., Verona.....                                            |
| 9164               | S. G. I. X. L. Acid Phos. ....                        | Planters Merc. Co., Woodville.....                                         |
| 9165               | S. G. I. X. L. Acid Phos. ....                        | R. W. Fagan & Co., Waynesboro.....<br>Average.....<br>Guarantee.....       |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 9154               | 16.10              | 5.50                    | 4.51                      | 10.01               | .88                 | 1.68               | 1.85             | 20.41                   |
|                    | <b>13.65</b>       | <b>6.38</b>             | <b>4.11</b>               | <b>10.49</b>        | <b>1.16</b>         | <b>1.67</b>        | <b>1.74</b>      | <b>20.86</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.67               | 1.50             | 19.56                   |
| 7954               | 16.42              | 10.23                   | 3.99                      | 14.22               | 1.14                |                    |                  | 15.24                   |
| 7955               | 11.62              | 9.95                    | 5.08                      | 15.03               | 1.52                |                    |                  | 16.03                   |
| 8172               | 16.65              | 10.18                   | 4.05                      | 14.23               | 2.32                |                    |                  | 15.25                   |
| 8173               | 16.68              | 10.40                   | 3.84                      | 14.24               | 2.30                |                    |                  | 15.28                   |
| 8332               | 16.98              | 12.41                   | 3.50                      | 15.91               | 1.04                |                    |                  | 17.15                   |
| 9155               | 15.45              | 9.88                    | 4.38                      | 14.26               | 2.25                |                    |                  | 15.25                   |
| 9156               | 17.18              | 10.27                   | 5.05                      | 15.32               | .96                 |                    |                  | 16.35                   |
|                    | <b>15.85</b>       | <b>10.48</b>            | <b>4.27</b>               | <b>14.75</b>        | <b>1.64</b>         |                    |                  | <b>15.79</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 9157               | 19.39              | 10.71                   | 2.78                      | 13.49               | 2.17                |                    |                  | 14.56                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 8174               | 18.16              | 9.24                    | 3.41                      | 12.65               | 2.83                |                    |                  | 13.57                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 7956               | 14.87              | 6.83                    | 3.81                      | 10.64               | 1.07                | 1.69               | 2.01             | 21.46                   |
| 8175               | 16.10              | 9.01                    | 2.83                      | 11.84               | 1.22                | 1.54               | 1.37             | 21.66                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 20.13                   |
| 7957               | 11.85              | 6.74                    | 3.61                      | 10.35               | 1.37                | 1.69               | 1.79             | 20.88                   |
| 7958               | 12.13              | 6.92                    | 3.85                      | 10.77               | 1.38                | 1.62               | 1.77             | 21.05                   |
| 8135               | 13.33              | 7.18                    | 2.82                      | 10.00               | 1.79                | 1.73               | 1.63             | 20.51                   |
| 8176               | 13.88              | 7.66                    | 3.17                      | 10.83               | 1.38                | 1.73               | 1.54             | 21.37                   |
| 8177               | 13.64              | 7.38                    | 3.25                      | 10.63               | 1.77                | 1.60               | 1.52             | 20.58                   |
| 9158               | 15.96              | 6.75                    | 2.94                      | 9.69                | 1.62                | 1.52               | 1.51             | 19.15                   |
| 9159               | 13.23              | 7.56                    | 3.21                      | 10.77               | 1.13                | 1.59               | 1.63             | 20.84                   |
| 9160               | 17.44              | 7.23                    | 3.17                      | 10.40               | 1.16                | 1.55               | 1.40             | 19.97                   |
| 9161               | 13.40              | 7.43                    | 3.29                      | 10.72               | 1.00                | 1.83               | 1.70             | 21.81                   |
|                    | <b>13.87</b>       | <b>7.21</b>             | <b>3.25</b>               | <b>10.46</b>        | <b>1.40</b>         | <b>1.65</b>        | <b>1.61</b>      | <b>20.68</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 20.13                   |
| 9162               | 15.89              | 7.27                    | 2.80                      | 10.07               | .77                 | 1.75               | 1.85             | 20.93                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 20.13                   |
| 7959               | 13.50              | 9.29                    | 4.23                      | 13.52               | 1.55                |                    |                  | 14.45                   |
| 8136               | 15.77              | 8.84                    | 4.19                      | 13.03               | 2.83                |                    |                  | 13.91                   |
| 8178               | 13.09              | 8.74                    | 3.20                      | 11.94               | 1.87                |                    |                  | 12.81                   |
| 9163               | 15.20              | 8.92                    | 6.47                      | 15.39               | .45                 |                    |                  | 16.28                   |
| 9164               | 14.39              | 7.07                    | 3.99                      | 11.06               | 2.19                |                    |                  | 11.77                   |
| 9165               | 14.23              | 8.11                    | 6.16                      | 14.27               | 1.46                |                    |                  | 15.08                   |
|                    | <b>14.36</b>       | <b>8.50</b>             | <b>4.70</b>               | <b>13.20</b>        | <b>1.72</b>         |                    |                  | <b>14.05</b>            |
|                    |                    | 9.00                    | 3.00                      | 12.00               | 2.00                |                    |                  | 12.90                   |

TABLE II.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.  | Where and from Whom Collected.       |
|--------------------|----------------------------------|--------------------------------------|
| 9166               | S. G. Royal Acid Phosphate       | Summit Merc. Col, Summit.....        |
| 9167               | S. G. Royal Acid Phosphate       | Biloxi Milling Co., Biloxi.....      |
|                    |                                  | Guarantee.....                       |
| 7980               | Scott's H. G. Acid Phosphate     | T. S. Turner, Canton.....            |
| 8273               | Scott's H. G. Acid Phosphate     | O. Hopkins, Hickory.....             |
| 8333               | Scott's H. G. Acid Phosphate     | V. P. Still & Son, Senatobia.....    |
| 9168               | Scott's H. G. Acid Phosphate     | H. B. Vaughn, Steens.....            |
| 9169               | Scott's H. G. Acid Phosphate     | Winner, Klein & Co., Meridian.....   |
| 9170               | Scott's H. G. Acid Phosphate     | Brooke Parker Lumber Co., Enterprise |
|                    |                                  | Average.....                         |
|                    |                                  | Guarantee.....                       |
| 9171               | S. G. Good as Gold Guano         | O. C. Carr, Pontotoc.....            |
|                    |                                  | Guarantee.....                       |
| 7960               | S. G. Mobile Double Eagle        |                                      |
|                    | Guano.....                       | Barfoot, Petty & Co., Neshoba.....   |
| 8137               | S. G. Mobile Double Eagle        |                                      |
|                    | Guano.....                       | McLean-O'Connell Co., Bassfield..... |
| 9172               | S. G. Mobile Double Eagle        |                                      |
|                    | Guano.....                       | T. J. Cole & Co., Ripley.....        |
| 9173               | S. G. Mobile Double Eagle        |                                      |
|                    | Guano.....                       | Mutual Merc. Co., Utica.....         |
| 9174               | S. G. Mobile Double Eagle        |                                      |
|                    | Guano.....                       | Bufkin & Davis, Waynesboro.....      |
|                    |                                  | Average.....                         |
|                    |                                  | Guarantee.....                       |
| 7961               | S. G. Mobile Standard Guano      | Mars Bros., Philadelphia.....        |
| 9175               | S. G. Mobile Standard Guano      | Williams-Brooke Co., Union.....      |
| 9176               | S. G. Mobile Standard Guano      | W. W. Harris, Iuka.....              |
|                    |                                  | Average.....                         |
|                    |                                  | Guarantee.....                       |
| 9177               | S. G. Royal Blood, Bone & Potash | Summit Merc. Co., Summit.....        |
|                    |                                  | Guarantee.....                       |
| 8138               | S. G. Royal Cot. Boll Guano      | Hawkins-McRaney Co., Bassfield.....  |
| 9178               | S. G. Royal Cot. Boll Guano      | O. C. Carr, Pontotoc.....            |
| 9179               | S. G. Royal Cot. Boll Guano      | Parsons, May, Oberschmidt & Co.,     |
|                    |                                  | Brookhaven.....                      |
|                    |                                  | Average.....                         |
|                    |                                  | Guarantee.....                       |
| 9180               | H. G. Royal Vegetable Fert...    | Union Merc. Co., New Albany.....     |
| 9181               | H. G. Royal Vegetable Fert...    | McLean-O'Connell Co., Bassfield..... |
|                    |                                  | Guarantee.....                       |
| 7962               | S. G. Scott's Gossypium          |                                      |
|                    | Phospho.....                     | Barfoot, Petty & Co., Neshoba.....   |
| 7981               | S. G. Scott's Gossypium          |                                      |
|                    | Phospho.....                     | T. S. Turner, Canton.....            |
| 8057               | S. G. Scott's Gossypium          |                                      |
|                    | Phospho.....                     | Smythe-Gaddis & Co., Forest.....     |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 9166               | 11.36              | 7.80                    | 6.82                      | 14.62               | 1.57                |                    |                  | \$15.40                 |
| 9167               | 15.95              | 8.60                    | 6.55                      | 15.15               | 1.07                |                    |                  | 16.01                   |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    |                  | 13.00                   |
| 7980               | 12.75              | 10.55                   | 3.46                      | 14.01               | 1.82                |                    |                  | 15.07                   |
| 8273               | 11.62              | 10.91                   | 3.31                      | 14.22               | 1.88                |                    |                  | 15.31                   |
| 8333               | 16.65              | 8.53                    | 3.82                      | 12.35               | 2.19                |                    |                  | 13.20                   |
| 9168               | 14.59              | 8.14                    | 7.40                      | 15.54               | .75                 |                    |                  | 16.35                   |
| 9169               | 15.78              | 8.15                    | 5.93                      | 14.08               | 1.36                |                    |                  | 14.90                   |
| 9170               | 12.02              | 9.98                    | 5.83                      | 15.81               | 1.32                |                    |                  | 16.81                   |
|                    | 13.90              | 9.38                    | 4.95                      | 14.33               | 1.55                |                    |                  | 15.27                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 9171               | 9.22               | 7.36                    | 3.99                      | 11.35               | 1.11                | 1.62               | .49              | 20.26                   |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | .35              | 18.70                   |
| 7960               | 12.09              | 7.88                    | 2.72                      | 10.60               | 2.17                | 1.47               | 1.51             | 20.06                   |
| 8137               | 12.59              | 6.63                    | 4.08                      | 10.71               | 1.82                | 2.16               | 1.57             | 22.89                   |
| 9172               | 12.38              | 7.29                    | 3.74                      | 11.03               | .61                 | 1.58               | 1.49             | 20.90                   |
| 9173               | 13.53              | 8.25                    | 2.45                      | 10.70               | 1.38                | 1.32               | 1.59             | 19.70                   |
| 9174               | 14.42              | 8.74                    | 1.90                      | 10.64               | .36                 | 1.64               | 1.76             | 21.16                   |
|                    | 13.00              | 7.76                    | 2.98                      | 10.74               | 1.27                | 1.63               | 1.59             | 20.94                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.13                   |
| 7961               | 12.75              | 5.62                    | 4.69                      | 10.31               | 1.25                | 1.37               | 2.59             | 20.36                   |
| 9175               | 13.01              | 6.81                    | 4.66                      | 11.47               | .83                 | 1.36               | 1.40             | 20.35                   |
| 9176               | 11.95              | 6.09                    | 3.52                      | 9.61                | .78                 | 1.79               | 1.85             | 20.46                   |
|                    | 12.57              | 6.17                    | 4.29                      | 10.46               | .95                 | 1.51               | 1.94             | 20.39                   |
|                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65               | 2.00             | 18.85                   |
| 9177               | 11.77              | 7.07                    | 4.81                      | 11.88               | .90                 | 1.15               | 1.43             | 20.02                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.13                   |
| 8138               | 11.99              | 5.90                    | 3.38                      | 9.28                | 1.11                | 2.11               | 2.23             | 21.80                   |
| 9178               | 11.75              | 4.72                    | 5.39                      | 10.11               | .55                 | 1.72               | 2.06             | 20.84                   |
| 9179               | 13.83              | 7.13                    | 4.38                      | 11.51               | 1.04                | 1.14               | 1.44             | 19.59                   |
|                    | 12.52              | 5.92                    | 4.38                      | 10.30               | .90                 | 1.66               | 1.91             | 20.75                   |
|                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65               | 2.00             | 18.85                   |
| 9180               | 10.37              | 6.19                    | 3.51                      | 9.70                | .54                 | 2.13               | 3.38             | 23.70                   |
| 9181               | 14.67              | 6.05                    | 3.36                      | 9.41                | .79                 | 2.57               | 5.18             | 27.19                   |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00                | 2.47               | 4.00             | 26.35                   |
| 7962               | 12.87              | 8.09                    | 2.68                      | 10.77               | 2.46                | 1.18               | 1.31             | 18.88                   |
| 7981               | 9.65               | 7.85                    | 2.46                      | 10.31               | 1.22                | 1.62               | 1.52             | 20.35                   |
| 8057               | 10.98              | 8.14                    | 2.24                      | 10.38               | 2.12                | 1.48               | 1.64             | 21.04                   |



| Laboratory Number. | Name of Brand and Manufacturer.                     | Where and from Whom Collected.        |
|--------------------|-----------------------------------------------------|---------------------------------------|
| 8058               | S. G. Scott's Gossypium Phospho .....               | Winner, Klein & Co., Meridian.....    |
| 8097               | S. G. Scott's Gossypium Phospho .....               | Donald Bros., New Hebron.....         |
| 8179               | S. G. Scott's Gossypium Phospho .....               | Lann & Carter, Aberdeen.....          |
| 8212               | S. G. Scott's Gossypium Phospho .....               | Biloxi Milling Co., Biloxi.....       |
| 9182               | S. G. Scott's Gossypium Phospho .....               | Wagner & Co., Water Valley.....       |
| 9183               | S. G. Scott's Gossypium Phospho .....               | Winona Merc. Co., Winona.....         |
| 9184               | S. G. Scott's Gossypium Phospho .....               | A. Roberts & Co., Lauderdale.....     |
| 9185               | S. G. Scott's Gossypium Phospho .....               | Williams & Freeman, Sandersville .... |
| 9186               | S. G. Scott's Gossypium Phospho .....               | Gaddis-McLaurin Co., Raymond.....     |
| 9187               | S. G. Scott's Gossypium Phospho .....               | Wetherbee-Huggins Co., Waynesboro     |
| 9188               | S. G. Scott's Gossypium Phospho .....               | Seward & Co., Ackerman.....           |
| 9189               | S. G. Scott's Gossypium Phospho .....               | J. K. Kirkland, Quitman.....          |
| 9190               | S. G. Scott's Gossypium Phospho .....               | Jacob McDaniel Co., Gloster.....      |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |
| 8274               | S. G. V. C. C. Standard Guano .....                 | J. T. Mitchel, Union.....             |
| 9191               | S. G. V. C. C. Standard Guano .....                 | Clay County Cotton Oil Co., Eupora    |
|                    |                                                     | Guarantee.....                        |
| 8180               | S. G. German Kainit.....                            | Lann & Carter, Aberdeen.....          |
| 8213               | S. G. German Kainit.....                            | Kennedy & Co., Wiggins.....           |
| 9192               | S. G. German Kainit.....                            | J. T. McClure, Shuqualak.....         |
| 9193               | S. G. German Kainit.....                            | Green & Wallace, Guntown.....         |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |
|                    | WESSON COTTON OIL & FERT. COMPANY,<br>Wesson, Miss. |                                       |
| 7982               | S. G. Mutual Friend Mixture.                        | Wesson Cotton Oil & Fert. Co., Wesson |
| 8214               | S. G. Mutual Friend Mixture.                        | Wesson Cotton Oil & Fert. Co., Wesson |
| 9194               | S. G. Mutual Friend Mixture.                        | Wesson Cotton Oil & Fert. Co., Wesson |
|                    |                                                     | Average.....                          |
|                    |                                                     | Guarantee.....                        |

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 8058               | 11.11              | 7.50                    | 2.13                      | 9.63                | 2.27                | 1.57               | 1.80             | \$19.69                 |
| 8097               | 12.72              | 7.85                    | 2.68                      | 10.53               | 1.55                | 1.65               | 1.69             | 20.91                   |
| 8179               | 12.65              | 7.70                    | 2.88                      | 10.58               | 1.45                | 1.69               | 1.54             | 20.94                   |
| 8212               | 14.03              | 7.30                    | 3.29                      | 10.59               | 1.50                | 1.79               | 1.99             | 21.83                   |
| 9182               | 11.94              | 7.25                    | 4.07                      | 11.32               | .87                 | 1.45               | 1.57             | 20.78                   |
| 9183               | 11.90              | 7.68                    | 3.50                      | 11.18               | .81                 | 1.44               | 1.53             | 20.59                   |
| 9184               | 13.11              | 7.92                    | 2.88                      | 10.80               | .75                 | 1.76               | 1.79             | 21.77                   |
| 9185               | 12.67              | 7.32                    | 3.13                      | 10.45               | .87                 | 1.75               | 1.74             | 21.23                   |
| 9186               | 13.58              | 8.30                    | 2.87                      | 11.17               | 1.01                | 1.57               | 1.72             | 21.38                   |
| 9187               | 11.54              | 7.34                    | 4.05                      | 11.39               | 1.78                | 1.37               | 1.88             | 20.91                   |
| 9188               | 14.05              | 7.47                    | 3.25                      | 10.72               | 1.11                | 1.58               | 1.42             | 20.49                   |
| 9189               | 12.42              | 7.91                    | 3.39                      | 11.30               | .51                 | 1.93               | 1.46             | 22.62                   |
| 9190               | 13.52              | 7.61                    | 2.71                      | 10.32               | .86                 | 1.61               | 2.04             | 20.90                   |
|                    | <b>12.42</b>       | <b>7.70</b>             | <b>3.02</b>               | <b>10.72</b>        | <b>1.32</b>         | <b>1.59</b>        | <b>1.67</b>      | <b>20.89</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.13                   |
| 8274               | 13.79              | 7.42                    | 2.16                      | 9.58                | 1.56                | 1.69               | 1.85             | 20.17                   |
| 9191               | 10.75              | 7.39                    | 3.87                      | 11.26               | .99                 | 1.81               | 1.51             | 22.10                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.13                   |
| 8180               | 4.73               |                         |                           |                     |                     |                    | 12.80            | 14.72                   |
| 8213               | 2.59               |                         |                           |                     |                     |                    | 12.18            | 14.01                   |
| 9192               | 3.03               |                         |                           |                     |                     |                    | 12.16            | 13.98                   |
| 9193               | 4.12               |                         |                           |                     |                     |                    | 12.18            | 14.01                   |
|                    | <b>3.62</b>        |                         |                           |                     |                     |                    | <b>12.33</b>     | <b>14.18</b>            |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
| 7982               | 12.59              | 7.09                    | 2.64                      | 9.73                | 1.33                | 1.62               | 1.99             | 20.18                   |
| 8214               | 13.08              | 6.72                    | 2.36                      | 9.08                | 1.19                | 1.87               | 2.12             | 20.58                   |
| 9194               | 11.41              | 5.26                    | 4.36                      | 9.62                | .50                 | 1.83               | 1.75             | 20.44                   |
|                    | <b>12.36</b>       | <b>6.36</b>             | <b>3.12</b>               | <b>9.48</b>         | <b>1.01</b>         | <b>1.77</b>        | <b>1.96</b>      | <b>20.40</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.75             | 19.21                   |

TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number                             | Name of Brand and Address<br>of Manufacturer.    | Laboratory Number | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |                        | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value<br>Per Ton. |
|-----------------------------------------------|--------------------------------------------------|-------------------|--------------------|----------------------------|------------------------------|------------------------|------------------------|--------------------|------------------|----------------------------|
|                                               |                                                  |                   |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. | Insoluble<br>Per Cent. |                    |                  |                            |
| ALABAMA CHEMICAL COMPANY, Montgomery, Ala.    |                                                  |                   |                    |                            |                              |                        |                        |                    |                  |                            |
| 7790                                          | Big Four H. G. Acid Phosphate .....              | 7790              | 12.69              | 12.23                      | 4.30                         | 16.53                  | .69                    |                    |                  | \$17.75                    |
|                                               | Guarantee.....                                   |                   |                    | 13.00                      | 3.00                         | 16.00                  | 2.00                   |                    |                  | 17.30                      |
| 7791                                          | H. G. Rex Dissolved Bone .....                   | 7791              | 11.84              | 10.03                      | 4.60                         | 14.63                  | .88                    |                    |                  | 15.63                      |
|                                               | Guarantee.....                                   |                   |                    | 11.00                      | 3.00                         | 14.00                  | 2.00                   |                    |                  | 15.10                      |
| 7792                                          | S. G. Rex Bone Compound .....                    | 7792              | 12.19              | 8.29                       | 2.49                         | 10.78                  | .70                    |                    | 2.72             | 15.82                      |
|                                               | Guarantee.....                                   |                   |                    | 8.00                       | 3.00                         | 11.00                  | 2.00                   |                    | 2.00             | 15.20                      |
| 7793                                          | S. G. Big Boll Guano .....                       | 7793              | 10.49              | 7.52                       | 3.12                         | 10.64                  | .52                    | 1.08               | 4.74             | 22.23                      |
|                                               | Guarantee.....                                   |                   |                    | 7.00                       | 3.00                         | 10.00                  | 2.00                   | .82                | 3.00             | 18.43                      |
| 7794                                          | S. G. Liberty Bell Blood and Bone .....          | 7794              | 9.34               | 5.33                       | 2.94                         | 8.27                   | .69                    | 2.39               | 2.82             | 22.43                      |
|                                               | Guarantee.....                                   |                   |                    | 5.00                       | 3.00                         | 8.00                   | 2.00                   | 1.65               | 2.00             | 18.20                      |
| 7795                                          | S. G. Success Mixture.....                       | 7795              | 10.90              | 8.05                       | 2.49                         | 10.54                  | .41                    | 2.06               | 2.82             | 23.88                      |
|                                               | Guarantee.....                                   |                   |                    | 6.50                       | 3.00                         | 9.50                   | 2.00                   | 1.65               | 1.50             | 19.43                      |
| AMERICAN GUANO COMPANY, Nashville, Tennessee. |                                                  |                   |                    |                            |                              |                        |                        |                    |                  |                            |
| 8514                                          | Mule Brand H. G. Dissolved Bone .....            | 8514              | 15.75              | 11.25                      | 4.50                         | 15.75                  | .77                    |                    |                  | 16.88                      |
|                                               | Guarantee.....                                   |                   |                    | 9.00                       | 5.00                         | 14.00                  | 2.00                   |                    |                  | 14.90                      |
| 8515                                          | Mule Brand S. G. Bourland's Cotton Grower .....  | 8515              | 12.42              | 7.83                       | 1.97                         | 9.80                   | .55                    | 1.68               | 5.41             | 24.50                      |
|                                               | Guarantee.....                                   |                   |                    | 5.00                       | 3.00                         | 8.00                   | 2.00                   | 1.64               | 3.00             | 19.31                      |
| ARMOUR FERTILIZER WORKS, Atlanta, Ga.         |                                                  |                   |                    |                            |                              |                        |                        |                    |                  |                            |
| 7671                                          | Shield Brand Armour's H. G. Superphosphate ..... | 7671              | 9.02               | 11.64                      | 2.86                         | 14.50                  | .14                    |                    |                  | 15.66                      |
|                                               | Guarantee.....                                   |                   |                    | 10.00                      | 4.00                         | 14.00                  | 1.00                   |                    |                  | 15.00                      |
| 7672                                          | Shield Brand Armour's S. G. Superphosphate ..... | 7672              | 7.30               | 9.58                       | 2.94                         | 12.52                  | .10                    |                    |                  | 13.48                      |
|                                               | Guarantee.....                                   |                   |                    | 10.00                      | 2.00                         | 12.00                  | 1.00                   |                    |                  | 13.00                      |

|      |                                                                                                  |      |       |      |      |       |      |       |         |
|------|--------------------------------------------------------------------------------------------------|------|-------|------|------|-------|------|-------|---------|
| 7673 | Shield Brand H. G. Superphosphate and Potash<br>Guarantee.                                       | 7673 | 8.50  | 7.91 | 2.21 | 10.12 | .15  | 4.08  | \$16.62 |
| 7674 | Shield Brand S. G. Superphosphate and Potash<br>Guarantee.                                       | 7674 | 6.47  | 8.20 | 2.36 | 10.56 | 1.00 | 4.00  | 16.40   |
| 7675 | Shield Brand H. G. Ammoniated Dissolved Bone and Potash<br>Guarantee.                            | 7675 | 9.34  | 7.84 | 2.01 | 9.85  | .47  | 2.21  | 14.98   |
| 7774 | H. G. Armour's Dried Blood.<br>Guarantee.                                                        | 7774 | 8.70  | 8.00 | 2.00 | 10.00 | 1.00 | 2.00  | 14.10   |
| 7932 | Shield Brand H. G. Fruit Crop Special<br>Guarantee.                                              | 7932 | 6.17  | 4.30 | 3.76 | 8.06  | .59  | 2.57  | 21.41   |
| 7676 | Shield Brand S. G. King Cotton<br>Guarantee.                                                     | 7676 | 8.50  | 5.96 | 2.06 | 8.02  | .46  | 2.00  | 20.70   |
| 7677 | Shield Brand H. G. Vegetable Fertilizer<br>Guarantee.                                            | 7677 | 7.71  | 4.80 | 1.29 | 6.09  | .27  | 5.00  | 22.63   |
| 7678 | S. G. German Kainit<br>Guarantee.                                                                | 7678 | 1.59  | 4.00 | 2.00 | 6.00  | 1.00 | 17.14 | 19.71   |
| 8001 | Castor Pomace.....<br>W. H. BARRON COMPANY, Crystal Springs, Miss.<br>Guarantee.                 | 8001 | 8.48  |      |      |       | 1.78 | 12.00 | 18.80   |
| 7733 | BIRMINGHAM FERTILIZER COMPANY, Birmingham, Ala.<br>Birmingham H. G. Acid Phosphate<br>Guarantee. | 7733 | 6.25  | 9.63 | 6.68 | 16.31 | .83  | .99   | 20.15   |
| 7734 | Monarch H. G. Acid Phosphate<br>Guarantee.                                                       | 7734 | 6.24  | 9.35 | 6.69 | 16.04 | .81  | .50   | 19.33   |
| 7735 | Birmingham H. G. Fertilizer<br>Guarantee.                                                        | 7735 | 6.00  | 6.75 | 5.06 | 11.81 | .55  | 2.21  | 24.01   |
| 7736 | Birmingham S. G. Fertilizer<br>Guarantee.                                                        | 7736 | 5.24  | 6.24 | 4.97 | 11.21 | .49  | 2.00  | 20.70   |
| 7737 | Monarch S. G. Blood and Bone<br>Guarantee.                                                       | 7737 | 9.73  | 6.14 | 4.38 | 10.52 | 1.82 | 1.81  | 22.76   |
| 7738 | Monarch S. G. Meal Mixture<br>Guarantee.                                                         | 7738 | 5.43  | 6.32 | 4.73 | 11.05 | .58  | 2.00  | 18.30   |
| 8277 | Monarch H. G. Potash Compound<br>Guarantee.                                                      | 8277 | 12.59 | 7.19 | 3.04 | 10.23 | .86  | 1.87  | 21.78   |
| 8061 | Simmons & Wright's H. G. Cotton Grower<br>Guarantee.                                             | 8061 | 10.94 | 7.36 | 3.37 | 10.73 | .78  | 2.00  | 20.10   |
|      |                                                                                                  |      |       | 8.00 | 2.00 | 10.00 | 2.00 | 1.50  | 19.53   |
|      |                                                                                                  |      |       | 8.00 | 2.00 | 10.00 | 2.00 | 4.49  | 25.34   |
|      |                                                                                                  |      |       | 8.00 | 2.00 | 10.00 | 2.00 | 3.00  | 21.85   |
|      |                                                                                                  |      |       | 8.00 | 2.00 | 10.00 | 2.00 | 3.47  | 27.33   |
|      |                                                                                                  |      |       | 8.00 | 2.00 | 10.00 | 2.00 | 3.00  | 25.09   |



TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number | Name of Brand and Address of Manufacturer.                | Laboratory Number | Moisture—per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|-------------------|-----------------------------------------------------------|-------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                   |                                                           |                   |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
|                   | BROOKHAVEN COTTON OIL & FERTILIZER Co., Brookhaven, Miss. |                   |                    |                         |                           |                     |                     |                    |                  |                         |
|                   | H. G. Acid Phosphate                                      |                   |                    |                         |                           |                     |                     |                    |                  |                         |
| 9448              | Brookhaven S. G. Blood and Bone                           | 9448              | 12.71              | 11.00                   | 3.00                      | 14.00               | 2.00                | 1.97               | 2.11             | \$15.10                 |
|                   | Guarantee.....                                            |                   |                    | 4.87                    | 3.28                      | 8.15                | .83                 | 1.97               |                  | 19.76                   |
|                   | Brookhaven H. G. Special                                  |                   |                    | 7.00                    | 1.50                      | 8.50                | 1.50                | 1.65               | 2.00             | 18.95                   |
|                   | Guarantee.....                                            |                   |                    |                         |                           |                     |                     |                    |                  |                         |
| 9449              | S. G. New South                                           | 9449              | 12.49              | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 2.00             | 20.70                   |
|                   | Guarantee.....                                            |                   |                    | 5.85                    | 2.65                      | 8.50                | .36                 | 1.87               | 2.55             | 20.35                   |
|                   | CANTON OIL MILL COMPANY, Canton, Miss.                    |                   |                    | 6.30                    | 2.00                      | 8.50                | 1.00                | 1.85               | 2.00             | 19.46                   |
| 7702              | H. G. Acid Phosphate                                      |                   |                    |                         |                           |                     |                     |                    |                  |                         |
|                   | Guarantee.....                                            | 7702              | 8.44               | 13.80                   | 4.49                      | 18.29               | .99                 |                    |                  | 19.67                   |
|                   |                                                           |                   |                    | 11.00                   | 4.00                      | 15.00               | 1.00                |                    |                  | 16.10                   |
| 7703              | S. G. Paragon                                             | 7703              | 4.63               | 7.66                    | 4.43                      | 12.09               | .81                 | 2.37               | .77              | 24.43                   |
|                   | Guarantee.....                                            |                   |                    | 6.00                    | 4.00                      | 10.00               | 1.05                | 2.00               | .50              | 20.18                   |
| 8366              | S. G. German Kaimit                                       | 8366              | 5.35               |                         |                           |                     |                     |                    | 11.48            | 13.20                   |
|                   | Guarantee.....                                            |                   |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
|                   | CAPITAL FERTILIZER & M'F'G. COMPANY, Jackson, Miss.       |                   |                    |                         |                           |                     |                     |                    |                  |                         |
| 7660              | H. G. Acid Phosphate                                      | 7660              | 12.00              | 8.81                    | 5.17                      | 13.08               | .38                 |                    |                  | 14.86                   |
|                   | Guarantee.....                                            |                   |                    | 10.00                   | 4.00                      | 14.00               | 1.00                |                    |                  | 15.00                   |
| 7661              | S. G. Acid Phosphate                                      | 7661              | 13.13              | 7.70                    | 4.80                      | 12.50               | .23                 |                    |                  | 13.27                   |
|                   | Guarantee.....                                            |                   |                    | 10.00                   | 2.00                      | 12.00               | 1.00                |                    |                  | 13.00                   |
| 7662              | H. G. Bone Meal                                           | 7662              | 3.68               |                         |                           |                     |                     | 3.06               |                  | 24.00                   |
|                   | Guarantee.....                                            |                   |                    |                         |                           |                     |                     | 2.50               |                  | 22.50                   |
| 7863              | S. G. Blood and Bone                                      | 7863              | 9.61               | 5.68                    | 3.69                      | 9.37                | .13                 | 2.33               | 2.01             | 22.51                   |
|                   | Guarantee.....                                            |                   |                    | 6.50                    | 1.50                      | 8.00                | 1.00                | 1.65               | 2.00             | 18.35                   |





|      |                                                                                                      |      |       |       |      |       |      |         |
|------|------------------------------------------------------------------------------------------------------|------|-------|-------|------|-------|------|---------|
| 8285 | FLORENCE COTTON OIL COMPANY, Florence, Ala.<br>Liberty H. G. Dissolved Bone                          | 8285 | 5.98  | 10.21 | 3.89 | 14.10 | 3.77 | \$15.12 |
|      | Guarantee                                                                                            |      |       | 10.00 | 4.00 | 14.00 | 2.00 | 15.00   |
| 8286 | Liberty S. G. Dissolved Bone                                                                         | 8286 | 9.71  | 9.13  | 5.42 | 14.55 | 2.26 | 15.46   |
|      | Guarantee                                                                                            |      |       | 10.00 | 2.00 | 12.00 | 2.00 | 13.00   |
| 8287 | Liberty S. G. Cottonseed Meal and Bone                                                               | 8287 | 11.65 | 5.80  | 3.43 | 9.23  | 2.34 | 3.05    |
|      | Guarantee                                                                                            |      |       | 6.00  | 2.00 | 8.00  | 1.65 | 2.00    |
| 8288 | Liberty S. G. Potash Guano                                                                           | 8288 | 13.79 | 6.37  | 3.29 | 9.66  | 1.94 | 3.02    |
|      | Guarantee                                                                                            |      |       | 6.00  | 4.00 | 10.00 | 2.00 | 13.90   |
| 8289 | Liberty H. G. Special                                                                                | 8289 | 17.39 | 5.04  | 3.01 | 8.05  | 2.17 | 2.85    |
|      | Guarantee                                                                                            |      |       | 6.00  | 4.00 | 10.00 | 2.00 | 2.00    |
| 8487 | S. G. German Kainit                                                                                  | 8487 | .41   |       |      |       |      | 13.74   |
|      | Guarantee                                                                                            |      |       |       |      |       |      | 12.00   |
| 7888 | GRASSELLI CHEMICAL COMPANY, Birmingham, Ala.<br>Grasselli's H. G. Acid Phosphate                     | 7888 | 16.80 | 12.54 | 2.85 | 15.39 | 1.13 | 16.64   |
|      | Guarantee                                                                                            |      |       | 12.00 | 2.00 | 14.00 | 1.00 | 15.20   |
| 7889 | Grasselli's S. G. Acid Phosphate                                                                     | 7889 | 17.57 | 11.68 | 2.64 | 14.32 | 1.11 | 15.45   |
|      | Guarantee                                                                                            |      |       | 10.00 | 2.00 | 12.00 | 1.00 | 13.00   |
| 7890 | Grasselli's S. G. Blood Meal Mixture                                                                 | 7890 | 14.18 | 7.56  | 3.58 | 11.14 | .47  | 1.60    |
|      | Guarantee                                                                                            |      |       | 8.00  | 2.00 | 10.00 | 1.00 | 1.50    |
| 7891 | Grasselli's H. G. Fertilizer                                                                         | 7891 | 12.64 | 7.28  | 2.98 | 10.26 | .40  | 2.28    |
|      | Guarantee                                                                                            |      |       | 8.00  | 2.00 | 10.00 | 1.00 | 2.00    |
| 7845 | GREAT SOUTHERN PHOSPHATE COMPANY, Mt. Pleasant, Tenn.<br>Great Southern H. G. Special Acid Phosphate | 7845 | 10.06 | 11.03 | 3.26 | 14.29 | 2.90 | 15.39   |
|      | Guarantee                                                                                            |      |       | 14.00 | 2.00 | 16.00 | 2.00 | 17.40   |
| 7874 | H. G. Great Southern Acid Phosphate                                                                  | 7874 | 14.27 | 11.51 | 3.08 | 14.59 | 1.24 | 15.74   |
|      | Guarantee                                                                                            |      |       | 12.00 | 2.00 | 14.00 | 2.00 | 15.20   |
| 7846 | H. G. Best by Test                                                                                   | 7846 | 8.32  | 7.05  | 3.43 | 10.48 | 4.14 | 2.57    |
|      | Guarantee                                                                                            |      |       | 7.00  | 3.00 | 10.00 | 5.00 | 2.00    |
| 7847 | S. G. Ever Ready                                                                                     | 7847 | 6.60  | 5.94  | 6.49 | 12.43 | 7.10 | 2.01    |
|      | Guarantee                                                                                            |      |       | 7.00  | 3.00 | 10.00 | 5.00 | 2.00    |
| 7848 | S. G. Farmer's Favorite                                                                              | 7848 | 8.80  | 8.65  | 3.42 | 12.07 | 2.53 | 1.40    |
|      | Guarantee                                                                                            |      |       | 7.00  | 3.00 | 10.00 | 5.00 | 1.00    |
| 7849 | O. G. Planters Champion                                                                              | 7849 | 9.37  | 7.68  | 4.38 | 12.06 | 3.35 | 1.23    |
|      | Guarantee                                                                                            |      |       | 7.00  | 3.00 | 10.00 | 5.00 | 1.00    |
| 7850 | S. G. Universal Cotton Grower                                                                        | 7850 | 7.41  | 6.65  | 3.40 | 10.05 | 4.68 | 2.67    |
|      | Guarantee                                                                                            |      |       | 6.00  | 2.00 | 8.00  | 5.00 | 2.00    |
| 7851 | S. G. German Kainit                                                                                  | 7851 | 1.21  |       |      |       |      | 11.98   |
|      | Guarantee                                                                                            |      |       |       |      |       |      | 12.40   |



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| Laboratory Number. | Name of Brand and Address<br>of Manufacturer.                               | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |  | Insoluble<br>Per Cent. | Nitrogen—Per Cent. | Potash—Per Cent. | Relative<br>Value<br>Per Ton. |
|--------------------|-----------------------------------------------------------------------------|--------------------|--------------------|----------------------------|------------------------------|------------------------|--|------------------------|--------------------|------------------|-------------------------------|
|                    |                                                                             |                    |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. |  |                        |                    |                  |                               |
|                    | GULFPORT COTTON OIL, FERTILIZER & M'F'G. COMPANY,<br>Gulfport, Mississippi. |                    |                    |                            |                              |                        |  |                        |                    |                  |                               |
| 7747               | Primo H. G. Acid Phosphate 16%<br>Guarantee.....                            | 7747               | 14.83              | 14.57                      | 2.26                         | 16.83                  |  | .65                    |                    |                  | \$18.29                       |
| 7748               | Primo H. G. Acid Phosphate 14%<br>Guarantee.....                            | 7748               | 14.43              | 14.00                      | 3.95                         | 15.73                  |  | 1.00                   |                    |                  | 17.40                         |
| 7749               | Primo S. G. Acid Phosphate<br>Guarantee.....                                | 7749               | 13.53              | 12.00                      | 2.00                         | 14.00                  |  | 1.00                   |                    |                  | 16.91                         |
| 7750               | Primo S. G. Acid Phosphate<br>Guarantee.....                                | 7750               | 14.14              | 10.00                      | 2.00                         | 12.00                  |  | 1.00                   |                    |                  | 15.20                         |
| 7751               | Primo H. G. Blood and Bone<br>Guarantee.....                                | 7751               | 13.53              | 8.00                       | 2.00                         | 11.87                  |  | .74                    |                    | 2.11             | 15.67                         |
| 7752               | Primo H. G. Cane Grower<br>Guarantee.....                                   | 7752               | 11.50              | 7.47                       | 4.00                         | 11.47                  |  | 1.50                   |                    | 2.00             | 16.13                         |
| 7753               | Primo S. G. Cotton and Corn Guano<br>Guarantee.....                         | 7753               | 11.92              | 8.00                       | 2.00                         | 10.00                  |  | .51                    | 1.57               | 2.27             | 14.10                         |
| 7754               | Primo S. G. Cottonseed Meal Compound<br>Guarantee.....                      | 7754               | 12.59              | 3.59                       | 3.03                         | 6.62                   |  | 1.41                   | 1.65               | 2.41             | 20.70                         |
| 7755               | Primo H. G. Cottonseed Meal Mixture<br>Guarantee.....                       | 7755               | 14.07              | 4.00                       | 1.00                         | 5.00                   |  | 1.00                   | 5.92               | 2.00             | 34.09                         |
| 7656               | Primo S. G. Frerich's Special Compound<br>Guarantee.....                    | 7656               | 14.56              | 7.00                       | 3.85                         | 10.45                  |  | .60                    | 5.76               | 2.21             | 22.50                         |
| 7756               | Primo H. G. Fruit Tree Special<br>Guarantee.....                            | 7756               | 7.38               | 8.01                       | 2.00                         | 9.00                   |  | 1.00                   | 1.65               | 2.00             | 19.50                         |
| 7757               | Primo H. G. Lawn Mixture<br>Guarantee.....                                  | 7757               | 10.28              | 8.00                       | 2.83                         | 10.84                  |  | .55                    | 1.81               | 2.73             | 23.10                         |
|                    |                                                                             |                    |                    | 7.00                       | 2.00                         | 9.00                   |  | 1.00                   | 1.65               | 2.00             | 19.50                         |
|                    |                                                                             |                    |                    | 8.01                       | 2.83                         | 10.84                  |  | .55                    | 1.81               | 2.00             | 20.70                         |
|                    |                                                                             |                    |                    | 7.00                       | 2.00                         | 9.00                   |  | 1.00                   | 1.65               | 2.50             | 24.48                         |
|                    |                                                                             |                    |                    | 8.00                       | 2.00                         | 10.00                  |  | 1.00                   | 1.65               | 2.00             | 20.70                         |
|                    |                                                                             |                    |                    | 8.33                       | 3.97                         | 12.30                  |  | .29                    | 1.10               | 1.61             | 20.61                         |
|                    |                                                                             |                    |                    | 10.00                      | 1.50                         | 11.50                  |  | 1.00                   | .83                | 1.00             | 18.12                         |
|                    |                                                                             |                    |                    | 4.12                       | 2.44                         | 6.56                   |  | .77                    | 1.72               | 9.55             | 25.49                         |
|                    |                                                                             |                    |                    | 5.00                       | 1.00                         | 6.00                   |  | 1.00                   | 1.65               | 8.00             | 22.90                         |
|                    |                                                                             |                    |                    | 5.25                       | 1.99                         | 7.24                   |  | .28                    | 3.74               | 2.61             | 26.45                         |
|                    |                                                                             |                    |                    | 4.00                       | 1.00                         | 5.00                   |  | 1.00                   | 4.12               | 2.00             | 24.68                         |



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| Laboratory Number. | Name of Brand and Address of Manufacturer.                   | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------------------------------------------------|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                                                              |                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 7855               | S. G. Black Hawk Acid Phosphate .....                        | 7855               | 9.06               | 7.77                    | 4.06                      | 11.83               | 2.24                |                    |                  | \$12.61                 |
|                    | Guarantee .....                                              |                    |                    | 10.00                   | 2.00                      | 12.00               | 1.00                | 2.72               |                  | 18.00                   |
| 7857               | H. G. Bone Meal .....                                        | 7857               | 10.27              |                         |                           |                     | 21.79               |                    |                  | 21.78                   |
|                    | Guarantee .....                                              |                    |                    |                         |                           |                     | 22.90               | 2.47               |                  | 21.33                   |
| 7908               | S. G. Chicago R. B. Superphosphate .....                     | 7908               | 8.10               | 5.63                    | 4.85                      | 10.48               | 1.36                | 1.69               | 1.39             | 20.45                   |
|                    | Guarantee .....                                              |                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.53                   |
| 7856               | H. G. Fruit and Vegetable Fertilizer .....                   | 7856               | 9.00               | 4.80                    | 1.67                      | 6.47                | .91                 | 3.14               | 3.62             | 24.32                   |
|                    | Guarantee .....                                              |                    |                    | 3.00                    | 3.00                      | 6.00                | 1.00                | 3.00               | 4.00             | 23.50                   |
| 7858               | S. G. Gulf States Guano .....                                | 7858               | 10.26              | 7.27                    | 2.89                      | 10.16               | 1.69                | 1.59               | 2.01             | 20.57                   |
|                    | Guarantee .....                                              |                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.80             | 19.27                   |
| 8062               | Huber's H. G. Veribest .....                                 | 8062               | 12.75              | 4.59                    | 2.58                      | 7.17                | .84                 | 4.32               | 3.31             | 29.43                   |
|                    | Guarantee .....                                              |                    |                    | 5.50                    | 2.00                      | 7.50                | 1.00                | 3.85               | 3.00             | 27.65                   |
| 7909               | S. G. Lampton's R. B. Superphosphate .....                   | 7909               | 7.77               | 5.82                    | 4.68                      | 10.50               | 1.28                | 1.79               | 1.36             | 20.86                   |
|                    | Guarantee .....                                              |                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.53                   |
| 7859               | S. G. Royal "C" Brand .....                                  | 7859               | 9.83               | 7.20                    | 2.75                      | 9.95                | 1.71                | 1.59               | 1.98             | 20.30                   |
|                    | Guarantee .....                                              |                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.80             | 19.27                   |
| 7860               | S. G. German Kainit .....                                    | 7860               | 2.04               |                         |                           |                     |                     |                    | 12.70            | 14.61                   |
|                    | Guarantee .....                                              |                    |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
|                    | JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.               |                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 9198               | Jefferson H. G. English Acid Phosphate .....                 | 9198               | 16.60              | 8.46                    | 5.51                      | 13.97               | 1.98                |                    |                  | 14.82                   |
|                    | Guarantee .....                                              |                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 8101               | S. G. Jefferson Meal A and Potash .....                      | 8101               | 16.11              | 2.86                    | 2.63                      | 5.49                | .31                 | 2.37               | 2.70             | 18.91                   |
|                    | Guarantee .....                                              |                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00                | 1.65               | 2.00             | 18.30                   |
| 8102               | S. G. Jefferson Slaughter House Blood, Bone and Potash ..... | 8102               | 10.59              | 3.16                    | 3.03                      | 6.19                | .54                 | 3.15               | 2.65             | 22.77                   |
|                    | Guarantee .....                                              |                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00                | 1.65               | 2.00             | 18.30                   |

Name of Brand and Address of Manufacturer.





TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number. | Name of Brand and Address<br>of Manufacturer.                                                 | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |                        | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value<br>Per Ton. |
|--------------------|-----------------------------------------------------------------------------------------------|--------------------|--------------------|----------------------------|------------------------------|------------------------|------------------------|--------------------|------------------|----------------------------|
|                    |                                                                                               |                    |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. | Insoluble<br>Per Cent. |                    |                  |                            |
| 7882               | H. G. Southern Special<br>Guarantee.                                                          | 7882               | 10.88              | 5.53<br>4.00               | 3.99<br>5.00                 | 9.52<br>9.00           | 2.38<br>3.00           | 2.47<br>2.47       | 2.20<br>2.00     | \$23.44<br>22.48           |
| 7689               | Meridian Fertilizer Factory, Meridian, Miss.<br>Meridian English Acid Phosphate<br>Guarantee. | 7689               | 12.04              | 10.25<br>10.00             | 5.31<br>2.00                 | 15.56<br>12.00         | .86<br>1.00            |                    |                  | 16.59<br>13.00             |
| 7688               | H. G. Meridian Southern Acid Phosphate<br>Guarantee.                                          | 7688               | 13.00              | 10.03<br>12.00             | 4.75<br>2.00                 | 14.78<br>14.00         | 1.24<br>1.00           |                    |                  | 15.78<br>15.20             |
| 9377               | H. G. Meridian Union Special Acid Phosphate<br>Guarantee.                                     | 9377               | 16.28              | 10.38<br>13.00             | 5.54<br>3.00                 | 15.92<br>16.00         | .52<br>1.00            |                    |                  | 16.96<br>17.30             |
| 7690               | S. G. Meridian Blood and Bone<br>Guarantee.                                                   | 7690               | 8.19               | 8.17<br>8.00               | 3.77<br>1.50                 | 11.94<br>9.50          | .91<br>1.00            | 1.74<br>1.65       | 2.26<br>1.50     | 23.51<br>19.58             |
| 7990               | S. G. Meridian Farmers Friend<br>Guarantee.                                                   | 7990               | 10.75              | 6.95<br>8.00               | 3.43<br>2.00                 | 10.38<br>10.00         | .84<br>1.00            | 2.06<br>1.65       | .78<br>.25       | 21.25<br>18.69             |
| 7691               | S. G. Meridian Home Mixture<br>Guarantee.                                                     | 7691               | 8.77               | 7.13<br>8.00               | 4.01<br>1.50                 | 11.14<br>9.50          | .59<br>1.00            | 1.88<br>1.65       | 1.89<br>1.50     | 22.66<br>19.58             |
| 7693               | H. G. Meridian Muriate of Potash<br>Guarantee.                                                | 7693               | .53                |                            |                              |                        |                        |                    | 52.60<br>48.00   | 60.49<br>55.20             |
| 7692               | H. G. Meridian Nitrate of Soda<br>Guarantee.                                                  | 7692               | .77                |                            |                              |                        |                        | 14.24<br>15.00     |                  | 56.96<br>60.00             |
| 7694               | S. G. Meridian Soluble Guano<br>Guarantee.                                                    | 7694               | 8.00               | 7.13<br>8.00               | 3.93<br>1.50                 | 11.06<br>9.50          | .70<br>1.00            | 1.92<br>20.50      | 1.89<br>1.50     | 22.73<br>19.58             |
| 8500               | H. G. Meridian Sulphate of Ammonia<br>Guarantee.                                              | 8500               | 1.00               |                            |                              |                        |                        | 19.00              |                  | 82.00                      |
| 7695               | H. G. Meridian Vegetable Grower<br>Guarantee.                                                 | 7695               | 9.63               | 6.81<br>6.00               | 2.65<br>2.00                 | 9.46<br>8.00           | .65<br>1.00            | 3.82<br>2.50       | 4.55<br>5.00     | 31.60<br>25.15             |

|      |                                                       |      |       |       |      |       |       |      |       |         |
|------|-------------------------------------------------------|------|-------|-------|------|-------|-------|------|-------|---------|
| 7696 | S. G. Meridian German Kainit                          | 7696 | 3.52  |       |      |       |       |      | 13.24 | \$15.23 |
|      | Guarantee                                             |      |       |       |      |       |       |      | 12.00 | 13.80   |
| 7697 | S. G. Hattiesburg Ammoniated Mixture with Bone        | 7697 | 10.68 | 8.20  | 3.54 | 11.74 | 1.07  | 2.02 | 2.02  | 24.14   |
|      | Guarantee                                             |      |       | 6.00  | 2.00 | 8.00  | 1.00  | 1.65 | 2.00  | 18.30   |
| 7726 | MISSISSIPPI FERTILIZER COMPANY, Jackson, Miss.        |      |       |       |      |       |       |      |       |         |
| 7726 | H. G. Acid Phosphate                                  | 7726 | 13.86 | 11.19 | 2.59 | 13.88 | 1.58  |      |       | 15.00   |
|      | Guarantee                                             |      |       | 12.00 | 2.00 | 14.00 | 1.00  |      |       | 15.20   |
| 7727 | S. G. Acid Phosphate                                  | 7727 | 13.50 | 10.61 | 2.57 | 13.18 | 1.41  |      |       | 14.24   |
|      | Guarantee                                             |      |       | 10.00 | 2.00 | 12.00 | 1.00  |      |       | 13.00   |
| 8226 | H. G. Bone Meal                                       | 8226 | 4.21  |       |      |       | 28.28 | 2.32 |       | 23.43   |
|      | Guarantee                                             |      |       |       |      |       | 18.00 | 2.50 |       | 19.00   |
| 7728 | S. G. Gerson's Special                                | 7728 | 9.79  | 7.06  | 2.39 | 9.45  | 1.18  | 1.83 |       | 20.63   |
|      | Guarantee                                             |      |       | 7.50  | 2.00 | 9.50  | 1.00  | 1.65 |       | 19.87   |
| 7729 | S. G. Horse Shoe Brand                                | 7729 | 9.56  | 6.84  | 2.68 | 9.52  | 1.37  | 1.74 |       | 20.36   |
|      | Guarantee                                             |      |       | 7.50  | 2.00 | 9.50  | 1.00  | 1.65 |       | 19.87   |
| 7730 | S. G. Improved Mississippi Mixture                    | 7730 | 9.76  | 7.01  | 2.49 | 9.50  | 1.32  | 1.81 |       | 20.63   |
|      | Guarantee                                             |      |       | 7.50  | 2.00 | 9.50  | 1.00  | 1.65 |       | 19.87   |
| 7731 | H. G. Mississippi Fruit and Vegetable Grower          | 7731 | 6.97  | 4.07  | 2.28 | 6.35  | .86   | 3.06 |       | 22.70   |
|      | Guarantee                                             |      |       | 3.00  | 3.00 | 6.00  | 1.00  | 3.00 |       | 23.50   |
| 7732 | S. G. German Kainit                                   | 7732 | .81   |       |      |       |       |      |       | 13.87   |
|      | Guarantee                                             |      |       |       |      |       |       |      |       | 12.00   |
|      |                                                       |      |       |       |      |       |       |      |       | 13.80   |
|      | MT. PLEASANT FERTILIZER COMPANY, Mt. Pleasant, Tenn.  |      |       |       |      |       |       |      |       |         |
| 7740 | Big Success H. G. Mt. Pleasant Special Acid Phosphate | 7740 | 14.60 | 11.65 | 3.21 | 14.86 | 1.22  |      |       | 16.03   |
|      | Guarantee                                             |      |       | 12.00 |      | 14.00 | 2.00  |      |       | 15.20   |
| 7741 | S. G. Black Patch Mt. Pleasant Soluble Bone           | 7741 | 10.24 | 9.47  | 4.99 | 14.46 | 4.48  |      |       | 15.41   |
|      | Guarantee                                             |      |       | 10.00 |      | 12.00 | 3.00  |      |       | 13.00   |
| 7815 | Big Success H. G. Dissolved Bone                      | 7815 | 13.29 | 13.02 | 2.59 | 15.61 | 2.00  |      |       | 16.91   |
|      | Guarantee                                             |      |       | 14.00 | 2.00 | 16.00 | 2.00  |      |       | 17.40   |
| 7780 | Big Success S. G. Banner Grain Grower                 | 7780 | 8.15  | 5.83  | 6.60 | 12.43 | 6.91  |      |       | 17.36   |
|      | Guarantee                                             |      |       | 7.00  | 3.00 | 10.00 | 5.00  |      |       | 14.00   |
| 7742 | O. G. Big Success Cotton Grower                       | 7742 | 9.94  | 7.83  | 4.06 | 11.89 | 3.45  | .83  |       | 18.54   |
|      | Guarantee                                             |      |       | 7.00  | 3.00 | 10.00 | 5.00  | .82  |       | 16.13   |
| 7816 | S. G. Georgia Electric Corn and Cotton Grower         | 7816 | 6.20  | 6.01  | 6.16 | 12.17 | 7.38  |      |       | 17.73   |
|      | Guarantee                                             |      |       | 7.00  | 6.00 | 12.00 | 5.00  |      |       | 14.00   |
| 7743 | S. G. North Mississippi Cotton Grower                 | 7743 | 10.41 | 8.28  | 3.90 | 12.18 | 2.23  | 1.67 |       | 22.45   |
|      | Guarantee                                             |      |       | 7.00  | 3.00 | 10.00 | 5.00  | 1.64 |       | 19.41   |
| 7744 | H. G. Soil Builder and Plant Food                     | 7744 | 9.78  | 6.75  | 3.77 | 10.52 | 4.11  | 1.62 |       | 21.69   |
|      | Guarantee                                             |      |       | 7.00  | 3.00 | 10.00 | 5.00  | 1.65 |       | 20.60   |

TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number.                                      | Name of Brand and Address of Manufacturer.       | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|---------------------------------------------------------|--------------------------------------------------|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                         |                                                  |                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 7745                                                    | S. G. White as Snow Cotton Special               | 7745               | 9.14               | 6.72                    | 3.53                      | 10.25               | 4.52                | 1.58               | 2.60             | \$21.26                 |
|                                                         | Guarantee                                        |                    |                    | 6.00                    | 2.00                      | 8.00                | 5.00                | 1.65               | 2.00             | 18.90                   |
| 7746                                                    | S. G. German Kainit                              | 7746               | 1.44               |                         |                           |                     |                     |                    | 11.92            | 13.71                   |
|                                                         | Guarantee                                        |                    |                    |                         |                           |                     |                     |                    | 12.00            | 13.80                   |
| NEW ORLEANS ACID & FERTILIZER COMPANY, New Orleans, La. |                                                  |                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 7758                                                    | H. G. Acid Phosphate 16%                         | 7758               | 13.64              | 14.69                   | 2.09                      | 16.78               | .28                 |                    |                  | 18.25                   |
|                                                         | Guarantee                                        |                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                   |
| 7559                                                    | S. G. Black Diamond Acid Phosphate               | 7559               | 11.86              | 7.69                    | 3.51                      | 11.20               | .38                 |                    |                  | 11.57                   |
|                                                         | Guarantee                                        |                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    |                  | 13.00                   |
| 7560                                                    | S. G. Crescent City Acid Phosphate               | 7560               | 10.04              | 7.50                    | 4.71                      | 12.21               | 1.39                |                    |                  | 12.96                   |
|                                                         | Guarantee                                        |                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    |                  | 13.00                   |
| 7561                                                    | S. G. Ammoniated R. B. Superphosphate and Potash | 7561               | 11.58              | 6.19                    | 2.87                      | 9.06                | .18                 | 1.72               | 1.57             | 19.27                   |
|                                                         | Guarantee                                        |                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.93                   |
| 7562                                                    | S. G. Blood, Bone and Beef                       | 7562               | 11.19              | 6.26                    | 2.82                      | 9.08                | .31                 | 1.67               | 1.50             | 19.02                   |
|                                                         | Guarantee                                        |                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.93                   |
| 7563                                                    | S. G. Blood, Bone and Potash                     | 7563               | 11.52              | 6.23                    | 2.83                      | 9.06                | .23                 | 1.67               | 1.52             | 19.02                   |
|                                                         | Guarantee                                        |                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.93                   |
| 8159                                                    | H. G. Bone Meal                                  | 8159               | 9.19               |                         |                           |                     | 18.42               | 3.04               |                  | 21.37                   |
|                                                         | Guarantee                                        |                    |                    |                         |                           |                     | 18.50               | 2.50               |                  | 19.25                   |
| 8106                                                    | S. G. Dissolved Bone and Potash                  | 8106               | 6.44               | 4.99                    | 5.96                      | 10.95               | .84                 |                    | 2.00             | 14.84                   |
|                                                         | Guarantee                                        |                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                |                    | 2.00             | 14.10                   |
| 8064                                                    | H. G. Economizer                                 | 8064               | 12.91              | 7.27                    | 4.07                      | 11.34               | .35                 | 1.80               | 2.47             | 23.24                   |
|                                                         | Guarantee                                        |                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.70                   |
| 7564                                                    | S. G. Gold Dust                                  | 7564               | 12.56              | 6.08                    | 3.24                      | 9.32                | .79                 | 1.74               | 1.75             | 19.83                   |
|                                                         | Guarantee                                        |                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.93                   |



|      |                                                                              |      |       |       |      |       |      |       |       |         |
|------|------------------------------------------------------------------------------|------|-------|-------|------|-------|------|-------|-------|---------|
| 7565 | S. G. Goldsmith's Improved Mixture                                           | 7565 | 12.52 | 6.40  | 3.21 | 9.61  | .63  | 1.80  | 1.71  | \$20.38 |
|      | Guarantee                                                                    |      |       | 7.00  | 2.00 | 9.00  | 2.00 | 1.65  | 1.50  | 18.93   |
| 7566 | H. G. Vegetable Grower                                                       | 7566 | 10.15 | 4.93  | 2.37 | 7.30  | .36  | 2.58  | 3.99  | 23.43   |
|      | Guarantee                                                                    |      |       | 4.00  | 2.00 | 6.00  | 2.00 | 2.47  | 4.00  | 21.48   |
| 7567 | S. G. German Kainit                                                          | 7567 | 2.24  |       |      |       |      |       | 12.48 | 14.35   |
|      | Guarantee                                                                    |      |       |       |      |       |      |       | 12.00 | 13.80   |
| 8508 | NEWTON OIL & M'F'G. COMPANY, Newton, Miss.<br>H. G. Acid Phosphate           | 8508 | 12.34 | 7.64  | 6.59 | 14.23 | .74  |       |       | 14.99   |
|      | Guarantee                                                                    |      |       | 12.00 | 2.00 | 14.00 | 1.00 |       |       | 15.20   |
| 8509 | S. G. Acid Phosphate                                                         | 8509 | 7.31  | 7.37  | 6.33 | 13.70 | 4.63 |       |       | 14.44   |
|      | Guarantee                                                                    |      |       | 10.00 | 2.00 | 12.00 | 1.00 |       |       | 13.00   |
| 9363 | S. G. Banner C. & C. Brand                                                   | 9363 | 8.47  | 6.73  | 2.49 | 9.22  | 3.04 | 1.84  | 2.24  | 20.75   |
|      | Guarantee                                                                    |      |       | 7.00  | 1.50 | 8.50  | 1.00 | 1.65  | 2.25  | 19.24   |
| 9364 | S. G. Pine Land Guano                                                        | 9364 | 8.21  | 6.38  | 2.76 | 9.14  | 3.19 | 1.80  | 2.25  | 20.48   |
|      | Guarantee                                                                    |      |       | 7.00  | 1.50 | 8.50  | 1.00 | 1.65  | 2.25  | 19.24   |
| 8357 | S. G. German Kainit                                                          | 8357 | 7.34  |       |      |       |      | 11.88 | 11.88 | 13.66   |
|      | Guarantee                                                                    |      |       |       |      |       |      | 12.00 | 12.00 | 13.80   |
| 8334 | NITRATE AGENCIES COMPANY, New Orleans, La.<br>Nitrate of Soda 95%            | 8334 | 3.45  |       |      |       |      | 14.52 |       | 58.08   |
|      | Guarantee                                                                    |      |       |       |      |       |      | 15.00 |       | 60.00   |
| 8488 | PLANTERS FERTILIZER & CHEMICAL CO., New Orleans, La.<br>S. G. Acid Phosphate | 8488 | 16.96 | 10.40 | 5.20 | 15.60 | .59  |       |       | 16.64   |
|      | Guarantee                                                                    |      |       | 10.00 | 2.00 | 12.00 | 2.00 |       |       | 13.00   |
| 8489 | Planters S. G. Cotton and Corn No. 1                                         | 8489 | 10.44 | 7.36  | 3.26 | 10.62 | 2.26 | 1.67  | 2.79  | 22.31   |
|      | Guarantee                                                                    |      |       | 7.00  | 2.50 | 9.50  | 2.00 | 1.65  | 1.50  | 19.48   |
| 8490 | Planters H. G. Cotton and Corn Maker                                         | 8490 | 14.35 | 7.10  | 2.98 | 10.08 | 1.51 | 1.72  | 2.46  | 21.51   |
|      | Guarantee                                                                    |      |       | 7.50  | 2.50 | 10.00 | 2.00 | 1.65  | 2.00  | 20.65   |
| 8491 | Planters S. G. Golden Mixture                                                | 8491 | 10.27 | 7.13  | 3.75 | 10.88 | 2.26 | 1.78  | 2.76  | 22.98   |
|      | Guarantee                                                                    |      |       | 7.00  | 2.50 | 9.50  | 2.00 | 1.65  | 1.50  | 19.48   |
| 8492 | Planters S. G. R. B Superphosphate                                           | 8492 | 7.46  | 4.29  | 2.56 | 6.85  | .47  | 3.31  | 2.72  | 24.33   |
|      | Guarantee                                                                    |      |       | 7.00  | 2.50 | 9.50  | 2.00 | 1.65  | 1.50  | 19.48   |
| 8493 | Planters S. G. German Kainit                                                 | 8493 | .71   |       |      |       |      |       | 13.66 | 15.71   |
|      | Guarantee                                                                    |      |       |       |      |       |      | 12.10 | 12.10 | 13.92   |
| 8481 | REFUGE COTTON OIL COMPANY, Columbus, Miss.<br>H. G. Acid Phosphate           | 8481 | 12.69 | 10.38 | 3.84 | 14.22 | 2.00 |       |       | 15.26   |
|      | Guarantee                                                                    |      |       | 12.00 | 2.00 | 14.00 | 2.00 |       |       | 15.20   |



TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number.                                  | Name of Brand and Address of Manufacturer.             | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     |      | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|-----------------------------------------------------|--------------------------------------------------------|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|------|--------------------|------------------|-------------------------|
|                                                     |                                                        |                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |      |                    |                  |                         |
| 8482                                                | S. G. Columbus Home Made Fertilizer Guarantee          | 8482               | 14.64              | 5.89                    | 2.97                      | 8.86                | .88                 | 1.95 | 1.99               | \$20.42          |                         |
| 8483                                                | H. G. Columbus Vegetable Compound Guarantee            | 8483               | 18.83              | 4.47                    | 2.23                      | 6.70                | .15                 | 2.93 | 9.02               | 29.91            |                         |
| 8484                                                | S. G. Refuge Corn Special Fertilizer Guarantee         | 8484               | 14.79              | 5.00                    | 2.00                      | 7.00                | .69                 | 3.30 | 9.00               | 31.75            |                         |
| 8513                                                | S. G. Refuge Standard Guano Guarantee                  | 8513               | 11.18              | 5.50                    | 2.50                      | 8.00                | 2.00                | 2.06 | 2.00               | 19.89            |                         |
| 7902                                                | S. G. Sandy Land Special Guarantee                     | 7902               | 8.99               | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65 | 2.69               | 20.73            |                         |
|                                                     |                                                        |                    |                    | 3.65                    | 3.55                      | 7.20                | .12                 | 1.77 | 3.98               | 19.94            |                         |
|                                                     |                                                        |                    |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | 1.65 | 4.00               | 19.40            |                         |
| SHUBUTA OIL & M'F'G. COMPANY, Shubuta, Mississippi. |                                                        |                    |                    |                         |                           |                     |                     |      |                    |                  |                         |
| 8478                                                | H. G. Acid Phosphate Guarantee                         | 8478               | 16.47              | 10.32                   | 3.92                      | 14.24               | 1.25                |      |                    |                  | 15.27                   |
| 8479                                                | S. G. Shubuta Mixture Guarantee                        | 8479               | 14.05              | 5.87                    | 3.21                      | 9.08                | .59                 | 1.88 | 1.78               | 20.14            |                         |
| 8480                                                | S. G. German Kainit Guarantee                          | 8480               | 3.36               | 6.00                    | 3.00                      | 9.00                | 1.00                | 1.65 | 1.60               | 18.94            |                         |
|                                                     |                                                        |                    |                    |                         |                           |                     |                     |      | 12.40              | 14.26            |                         |
|                                                     |                                                        |                    |                    |                         |                           |                     |                     |      | 12.00              | 13.80            |                         |
| SOUTHERN OIL & FERTILIZER COMPANY, Meridian, Miss.  |                                                        |                    |                    |                         |                           |                     |                     |      |                    |                  |                         |
| 7811                                                | Southern's 20th Century H. G. Acid Phosphate Guarantee | 7811               | 14.58              | 10.78                   | 3.83                      | 14.61               | 1.45                |      |                    |                  | 15.69                   |
| 7812                                                | Southern's S. G. Acid Phosphate Guarantee              | 7812               | 4.97               | 7.85                    | 5.03                      | 12.88               | 3.02                |      |                    |                  | 15.00                   |
| 7813                                                | Southern's S. G. Cotton Grower Guarantee               | 7813               | 4.35               | 9.00                    | 3.00                      | 12.00               | 2.00                |      |                    |                  | 13.67                   |
|                                                     |                                                        |                    |                    | 4.29                    | 3.60                      | 7.89                | 2.10                | 1.89 | 3.19               | 20.34            |                         |
|                                                     |                                                        |                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65 | 2.00               | 19.50            |                         |



TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| MISSISSIPPI EXPERIMENT STATION.          |                                                      |                    |                    |                            |                              |                        |              |                        |                    |                  |                               |
|------------------------------------------|------------------------------------------------------|--------------------|--------------------|----------------------------|------------------------------|------------------------|--------------|------------------------|--------------------|------------------|-------------------------------|
| Laboratory Number.                       | Name of Brand and Address<br>of Manufacturer.        | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |              | Insoluble<br>Per Cent. | Nitrogen—Per Cent. | Potash—Per Cent. | Relative<br>Value<br>Per Ton. |
|                                          |                                                      |                    |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. |              |                        |                    |                  |                               |
| 7701                                     | Threefoot's S. G. Improved Mixture<br>Guarantee..... | 7701               | 8.17               | 7.20<br>7.00               | 3.97<br>2.50                 | 11.17<br>9.50          | .82<br>1.00  | 1.81<br>1.67           | 1.85<br>1.50       | \$22.37<br>19.56 |                               |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss. |                                                      |                    |                    |                            |                              |                        |              |                        |                    |                  |                               |
| 7837                                     | H. G. Cotton Belt Acid Phosphate<br>Guarantee.....   | 7837               | 15.08              | 10.49<br>12.00             | 4.07<br>2.00                 | 14.56<br>14.00         | 2.01<br>2.00 |                        |                    |                  | 15.61<br>15.20                |
| 7838                                     | S. G. Cotton Belt Acid Phosphate<br>Guarantee.....   | 7838               | 15.43              | 10.50<br>10.00             | 4.08<br>2.00                 | 14.58<br>12.00         | 2.16<br>2.00 |                        |                    |                  | 15.63<br>13.00                |
| 7903                                     | H. G. Levi Phillips Acid Phosphate<br>Guarantee..... | 7903               | 14.98              | 10.02<br>12.00             | 4.88<br>2.00                 | 14.90<br>14.00         | 2.03<br>2.00 |                        |                    |                  | 15.90<br>15.20                |
| 7842                                     | Tupelo H. G. Acid Phosphate<br>Guarantee.....        | 7842               | 9.44               | 10.98<br>12.00             | 3.84<br>2.00                 | 14.82<br>14.00         | 2.53<br>2.00 |                        |                    |                  | 15.92<br>15.20                |
| 7839                                     | S. G. Cotton Belt Blood and Bone<br>Guarantee.....   | 7839               | 13.48              | 6.51<br>8.00               | 4.35<br>2.00                 | 10.86<br>10.00         | .77<br>1.00  | 1.80<br>1.65           | 1.51<br>1.50       | 21.53<br>20.13   |                               |
| 7840                                     | H. G. Cotton Belt Fertilizer<br>Guarantee.....       | 7840               | 9.17               | 7.46<br>8.00               | 3.42<br>2.00                 | 10.88<br>10.00         | 1.15<br>1.00 | 1.72<br>1.65           | 2.60<br>2.00       | 22.58<br>20.70   |                               |
| 7841                                     | S. G. Cotton Belt Fertilizer<br>Guarantee.....       | 7841               | 9.92               | 7.13<br>8.00               | 3.15<br>2.00                 | 10.28<br>10.00         | 1.23<br>1.00 | 1.78<br>1.65           | 1.78<br>1.50       | 21.19<br>20.13   |                               |
| 7904                                     | S. G. Levi Phillips Mixture<br>Guarantee.....        | 7904               | 11.68              | 7.69<br>8.00               | 2.93<br>2.00                 | 10.62<br>10.00         | 1.24<br>1.00 | 1.71<br>1.65           | 2.52<br>1.50       | 22.19<br>20.13   |                               |
| 7843                                     | Tupelo S. G. Fertilizer<br>Guarantee.....            | 7843               | 9.10               | 7.19<br>8.00               | 3.14<br>2.00                 | 10.33<br>10.00         | 1.30<br>1.00 | 1.82<br>1.65           | 1.88<br>1.50       | 21.52<br>20.13   |                               |
| 7844                                     | Tupelo S. G. German Kainit<br>Guarantee.....         | 7844               | 2.94               |                            |                              |                        |              |                        |                    |                  | 13.30<br>12.00                |
|                                          |                                                      |                    |                    |                            |                              |                        |              |                        |                    |                  | 15.30<br>13.80                |





TABLE III.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1907-1908.

| Laboratory Number. | Name of Brand and Address of Manufacturer.            | Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |           |      | Insoluble Per Cent. | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|-------------------------------------------------------|--------------------|--------------------|-------------------------|---------------------------|---------------------|-----------|------|---------------------|--------------------|------------------|-------------------------|
|                    |                                                       |                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Per Cent. |      |                     |                    |                  |                         |
| 7872               | S. G. Royal Cotton Boll Guano                         | 7872               | 8.69               | 7.52                    | 3.00                      | 10.52               | 1.87      | 1.94 | 2.53                | 22.99              |                  |                         |
|                    | Guarantee                                             |                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00      | 1.65 | 2.00                | 18.85              |                  |                         |
| 8497               | Royal H. G. Guano                                     | 8497               | 12.05              | 7.89                    | 3.60                      | 11.49               | 1.75      | 1.87 | 2.79                | 24.12              |                  |                         |
|                    | Guarantee                                             |                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00      | 1.65 | 2.00                | 20.70              |                  |                         |
| 7822               | H. G. Royal Vegetable Fertilizer                      | 7822               | 9.76               | 6.38                    | 3.01                      | 9.39                | .95       | 2.78 | 4.54                | 27.31              |                  |                         |
|                    | Guarantee                                             |                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00      | 2.47 | 4.00                | 26.35              |                  |                         |
| 7825               | S. G. Scott's Gossypium Phospho                       | 7825               | 9.74               | 8.20                    | 2.90                      | 11.10               | .90       | 1.94 | 1.69                | 22.73              |                  |                         |
|                    | Guarantee                                             |                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00      | 1.65 | 1.50                | 20.13              |                  |                         |
| 7826               | H. G. Scott's Potasso Phospho                         | 7826               | 13.14              | 7.07                    | 5.34                      | 12.41               | 1.14      |      | 2.44                | 17.16              |                  |                         |
|                    | Guarantee                                             |                    |                    | 9.00                    | 3.00                      | 12.00               | 2.00      |      | 2.00                | 16.40              |                  |                         |
| 7873               | S. G. Scott's State Standard Guano                    | 7873               | 9.40               | 7.46                    | 2.42                      | 9.88                | 1.15      | 1.86 | 2.78                | 22.25              |                  |                         |
|                    | Guarantee                                             |                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00      | 1.65 | 2.00                | 18.85              |                  |                         |
| 7999               | H. G. Sulphate of Potash                              | 7999               | .39                |                         |                           |                     |           |      | 49.80               | 57.27              |                  |                         |
|                    | Guarantee                                             |                    |                    |                         |                           |                     |           |      | 47.00               | 54.05              |                  |                         |
| 8187               | H. G. Victor Guano                                    | 8187               | 12.38              | 5.21                    | 3.89                      | 9.10                | 1.38      | 1.82 | 2.56                | 20.76              |                  |                         |
|                    | Guarantee                                             |                    |                    | 6.00                    | 4.00                      | 10.00               | 2.00      | 1.65 | 2.00                | 20.50              |                  |                         |
| 8227               | H. G. V. C. Garden Truck Special                      | 8227               | 7.98               | 4.25                    | 2.52                      | 6.77                | .52       | 5.39 | 4.02                | 34.06              |                  |                         |
|                    | Guarantee                                             |                    |                    | 4.00                    | 2.00                      | 6.00                | 2.00      | 4.95 | 4.00                | 31.40              |                  |                         |
| 7827               | S. G. V. C. C. Standard Guano                         | 7827               | 9.93               | 8.17                    | 3.02                      | 11.19               | .83       | 1.99 | 1.82                | 23.18              |                  |                         |
|                    | Guarantee                                             |                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00      | 1.65 | 1.50                | 20.13              |                  |                         |
| 7829               | S. G. German Kainit                                   | 7829               | 1.71               |                         |                           |                     |           |      | 12.88               | 14.81              |                  |                         |
|                    | Guarantee                                             |                    |                    |                         |                           |                     |           |      | 12.00               | 13.80              |                  |                         |
|                    | WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss. |                    |                    |                         |                           |                     |           |      |                     |                    |                  |                         |
| 7911               | S. G. Mutual Friend Mixture                           | 7911               | 11.48              | 7.00                    | 2.45                      | 9.45                | 1.15      | 1.70 | 1.99                | 20.18              |                  |                         |
|                    | Guarantee                                             |                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00      | 1.65 | 1.75                | 19.21              |                  |                         |

# Mississippi Agricultural Experiment Station.

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## VARIETIES OF COTTON, 1908.

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BY W. R. PERKINS.

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In future the growing of good crops of cotton will depend very largely upon early maturity. The boll weevil, which will undoubtedly spread over the entire State within the next few years, usually becomes so numerous by the first of August as to preclude the possibility of making much cotton after that date. The crop will have to be made early and will generally mean no top crop.

Early maturing varieties will become an important factor in cotton growing in the presence of boll weevils. Realizing this we have taken a great deal of pains for several years in making tests of varieties and present in the following table data from the test during the present year.

## VARIETIES OF COTTON, 1908.

## YIELD OF VARIETIES OF COTTON, 1908.

| VARIETY.              | First Picking,<br>September 1st. |      | Second Picking,<br>September 11th. |      | Third Picking,<br>September 21st. |      | Fourth Picking,<br>October 12th. |      | Fifth Picking,<br>October 27th. |      | Sixth Picking,<br>November 17th. |         | Seed Cotton Yield<br>per acre—Lbs. | Per Cent. Lint. |      | Lint Cotton—<br>Lbs. per Acre. |      | Seed—<br>Lbs. per Acre. |      | Value Lint per<br>Acre at 9c. |      | Value Seed per<br>Acre at \$13 per<br>Ton. |      | Total per Acre. |      | Length Staple.<br>INCHES |      | Number Seed<br>to Lb. |      | Number Bolls<br>to Lb. |      | Rank. |    |
|-----------------------|----------------------------------|------|------------------------------------|------|-----------------------------------|------|----------------------------------|------|---------------------------------|------|----------------------------------|---------|------------------------------------|-----------------|------|--------------------------------|------|-------------------------|------|-------------------------------|------|--------------------------------------------|------|-----------------|------|--------------------------|------|-----------------------|------|------------------------|------|-------|----|
|                       | LBS.                             | LBS. | LBS.                               | LBS. | LBS.                              | LBS. | LBS.                             | LBS. | LBS.                            | LBS. | LBS.                             | LBS.    | LBS.                               | LBS.            | LBS. | LBS.                           | LBS. | LBS.                    | LBS. | LBS.                          | LBS. | LBS.                                       | LBS. | LBS.            | LBS. | LBS.                     | LBS. | LBS.                  | LBS. | LBS.                   | LBS. |       |    |
| Cleveland Big Boll    | 15                               | 120  | 75                                 | 62   | 29                                | 21   | 3220                             | 35.5 | 1143                            | 2077 | \$102.87                         | \$12.46 | \$115.33                           | 1               | 3450 | 53                             | 1    | 3450                    | 53   | 1                             | 3450 | 53                                         | 1    | 3450            | 53   | 1                        | 3450 | 53                    | 1    | 3450                   | 53   | 1     |    |
| Cook's Improved       | 11                               | 89   | 83                                 | 62   | 35                                | 30   | 3100                             | 37.0 | 1147                            | 1953 | 103.23                           | 11.72   | 114.95                             | 1               | 3650 | 54                             | 2    | 3650                    | 54   | 2                             | 3650 | 54                                         | 2    | 3650            | 54   | 2                        | 3650 | 54                    | 2    | 3650                   | 54   | 2     |    |
| Smith's Double Header | 4                                | 33   | 108                                | 75   | 51                                | 29   | 3000                             | 35.0 | 1050                            | 1950 | 94.50                            | 11.70   | 106.20                             | 1               | 1-16 | 2880                           | 47   | 3                       | 2880 | 47                            | 3    | 2880                                       | 47   | 3               | 2880 | 47                       | 3    | 2880                  | 47   | 3                      | 2880 | 47    | 3  |
| Russell Big Boll      | 8                                | 69   | 104                                | 76   | 36                                | 23   | 3160                             | 31.0 | 979                             | 2181 | 88.11                            | 13.08   | 101.19                             | 1               | 1-8  | 3250                           | 50   | 4                       | 3250 | 50                            | 4    | 3250                                       | 50   | 4               | 3250 | 50                       | 4    | 3250                  | 50   | 4                      | 3250 | 50    | 4  |
| McKay's July          | 10                               | 80   | 76                                 | 66   | 36                                | 17   | 2850                             | 35.0 | 997                             | 1853 | 89.73                            | 11.12   | 100.85                             | 3/4             | 4420 | 66                             | 5    | 4420                    | 66   | 5                             | 4420 | 66                                         | 5    | 4420            | 66   | 5                        | 4420 | 66                    | 5    | 4420                   | 66   | 5     |    |
| Excelsior             | 7                                | 84   | 72                                 | 57   | 39                                | 14   | 2730                             | 36.5 | 996                             | 1734 | 89.64                            | 10.40   | 100.04                             | 1               | 4190 | 68                             | 6    | 4190                    | 68   | 6                             | 4190 | 68                                         | 6    | 4190            | 68   | 6                        | 4190 | 68                    | 6    | 4190                   | 68   | 6     |    |
| Christopher           | 8                                | 73   | 96                                 | 53   | 33                                | 18   | 2810                             | 35.0 | 983                             | 1827 | 88.47                            | 10.96   | 99.43                              | 7-8             | 48   | 7                              | 48   | 7                       | 48   | 7                             | 48   | 7                                          | 48   | 7               | 48   | 7                        | 48   | 7                     | 48   | 7                      | 48   | 7     |    |
| Berryhill's Improved  | 14                               | 85   | 81                                 | 61   | 30                                | 14   | 2850                             | 34.5 | 980                             | 1870 | 88.20                            | 11.22   | 99.42                              | 1               | 4920 | 73                             | 8    | 4920                    | 73   | 8                             | 4920 | 73                                         | 8    | 4920            | 73   | 8                        | 4920 | 73                    | 8    | 4920                   | 73   | 8     |    |
| Triumph               | 14                               | 72   | 86                                 | 53   | 30                                | 27   | 2820                             | 34.5 | 973                             | 1847 | 87.57                            | 11.08   | 98.65                              | 1               | 3240 | 46                             | 9    | 3240                    | 46   | 9                             | 3240 | 46                                         | 9    | 3240            | 46   | 9                        | 3240 | 46                    | 9    | 3240                   | 46   | 9     |    |
| Moss' Improved        | 6                                | 43   | 73                                 | 64   | 43                                | 28   | 2570                             | 38.5 | 989                             | 1581 | 89.01                            | 9.48    | 98.49                              | 7-8             | 4560 | 70                             | 10   | 4560                    | 70   | 10                            | 4560 | 70                                         | 10   | 4560            | 70   | 10                       | 4560 | 70                    | 10   | 4560                   | 70   | 10    |    |
| Lewis' Prize          | 9                                | 53   | 86                                 | 75   | 35                                | 20   | 2780                             | 35.0 | 973                             | 1807 | 87.57                            | 10.84   | 98.41                              | 1               | 3000 | 67                             | 11   | 3000                    | 67   | 11                            | 3000 | 67                                         | 11   | 3000            | 67   | 11                       | 3000 | 67                    | 11   | 3000                   | 67   | 11    |    |
| Lowe's Improved       | 6                                | 41   | 103                                | 66   | 35                                | 34   | 2850                             | 33.5 | 954                             | 1896 | 85.86                            | 11.37   | 97.23                              | 1               | 1-16 | 4712                           | 47   | 12                      | 4712 | 47                            | 12   | 4712                                       | 47   | 12              | 4712 | 47                       | 12   | 4712                  | 47   | 12                     | 4712 | 47    | 12 |
| Peterkin              | 3                                | 25   | 94                                 | 61   | 45                                | 37   | 2650                             | 35.5 | 941                             | 1709 | 84.69                            | 10.25   | 94.94                              | 1               | 4450 | 68                             | 13   | 4450                    | 68   | 13                            | 4450 | 68                                         | 13   | 4450            | 68   | 13                       | 4450 | 68                    | 13   | 4450                   | 68   | 13    |    |
| Brandon               | 8                                | 43   | 76                                 | 69   | 47                                | 30   | 2730                             | 33.6 | 917                             | 1813 | 82.53                            | 10.87   | 93.40                              | 1               | 1-16 | 4240                           | 64   | 14                      | 4240 | 64                            | 14   | 4240                                       | 64   | 14              | 4240 | 64                       | 14   | 4240                  | 64   | 14                     | 4240 | 64    | 14 |
| Neely's Improved      | 20                               | 87   | 75                                 | 50   | 19                                | 10   | 2610                             | 35.0 | 913                             | 1697 | 82.17                            | 10.18   | 92.35                              | 1               | 3580 | 80                             | 15   | 3580                    | 80   | 15                            | 3580 | 80                                         | 15   | 3580            | 80   | 15                       | 3580 | 80                    | 15   | 3580                   | 80   | 15    |    |
| Toole's Improved      | 4                                | 52   | 72                                 | 54   | 38                                | 26   | 2460                             | 35.5 | 873                             | 1587 | 78.57                            | 9.52    | 88.09                              | 1               | 5430 | 77                             | 16   | 5430                    | 77   | 16                            | 5430 | 77                                         | 16   | 5430            | 77   | 16                       | 5430 | 77                    | 16   | 5430                   | 77   | 16    |    |
| Tatum's Improved      | 8                                | 74   | 82                                 | 55   | 28                                | 22   | 2690                             | 31.5 | 847                             | 1843 | 76.23                            | 11.06   | 87.29                              | 1               | 3180 | 51                             | 17   | 3180                    | 51   | 17                            | 3180 | 51                                         | 17   | 3180            | 51   | 17                       | 3180 | 51                    | 17   | 3180                   | 51   | 17    |    |
| Hawkins' Improved     | 9                                | 48   | 74                                 | 68   | 40                                | 17   | 2560                             | 33.0 | 844                             | 1716 | 75.96                            | 10.29   | 86.25                              | 1               | 4480 | 65                             | 18   | 4480                    | 65   | 18                            | 4480 | 65                                         | 18   | 4480            | 65   | 18                       | 4480 | 65                    | 18   | 4480                   | 65   | 18    |    |
| Sugar Loaf            | 29                               | 87   | 53                                 | 31   | 9                                 | 12   | 2210                             | 35.5 | 784                             | 1426 | 70.56                            | 8.55    | 79.11                              | 3/4             | 4480 | 87                             | 19   | 4480                    | 87   | 19                            | 4480 | 87                                         | 19   | 4480            | 87   | 19                       | 4480 | 87                    | 19   | 4480                   | 87   | 19    |    |
| Columbia              | 10                               | 78   | 69                                 | 49   | 19                                | 11   | 2360                             | 29.0 | 684                             | 1676 | * 78.66                          | 10.05   | 88.71                              | 1               | 5-16 | 3430                           | 58   | 3430                    | 58   | 3430                          | 58   | 3430                                       | 58   | 3430            | 58   | 3430                     | 58   | 3430                  | 58   | 3430                   | 58   | 3430  |    |

\* 11 1/2c per Lb.

**Notes on varieties.**—The table gives the weight of seed cotton secured at each picking from the tenth-acre plots and the date of the picking. Since the different varieties were all grown on the same kind of soil, planted the same day and worked just alike these columns of figures will give a very accurate idea of the relative earliness of the different kinds.

Other columns give the total yield per acre, per cent. of lint to seed cotton, value of lint and seed per acre, length of staple, size of bolls, size of seed and rank of cotton in the test.

This data is sufficient to give a fairly satisfactory knowledge of the main points of the varieties without further comment, but we add the following as our opinion without prejudice in favor of or against any.

**Cleveland Big Boll.**—This variety has been grown in our tests for three years. It stood second in 1906, first in 1907 and first, by a small margin, in 1908. It has large bolls and good fiber which measures from 1 inch to 1 1-16 inch. The stalk is branching in growth with five or six primary limbs; the first limbs are long and begin near the ground, an essential feature in early cotton. 1350 pounds per acre had been gathered from it this year by September 11 on strong bottom land, which was 180 pounds per acre more than was gathered by that date from the next earliest variety (Sugar Loaf or King). I do not hesitate to say that pure Cleveland Big Boll is one of the best varieties for all parts of this state, whether the boll weevil be present or not.

**Cook's Improved.**—This variety has always stood at the top or very near to it in variety tests at all of the Stations. The stalk is generally branching, with fewer primary limbs than Cleveland. Long, short-jointed fruit limbs make it productive and comparatively early. The boll is medium to large and round in shape. When pure there is no better producer of lint cotton to be found, though it is too short—generally about 7-8 inch—to bring the best price in some markets.

The variety is undoubtedly suffering for lack of selection of seed, both in yielding quality and from the presence of the fungus disease known as Anthracnose or pink boll rot. This disease seems to be worse on Cook's Improved than most other varieties, and the only method so far suggested to combat it is to select seed from stalks that are not affected. Our work in selecting this cotton during the past few years indicates that the disease may be prevented by careful selection. Several of the strains of the variety grown this year were free from the disease and none were seriously affected. We recom-



mend this variety highly but are of the opinion that the seed offered for sale are very inferior as a general thing.

**Smith's Double Header. Green seed.**—This is the first time we have grown this variety. It is very promising, having very large bolls and good quality of fibre. It yields well and turns out a high per cent of lint. The fruit limbs are short and not so near the ground making it rather late in maturing.

**Russell Big Boll. Green seed.**—One of the most reliable and best varieties grown in the state. A little late in maturing, big bolls, and a heavy yielder of seed cotton though the per cent of lint is low. The quality of the fiber is first class and should bring a premium over ordinary short staple cotton. It needs to be improved in its time of maturing and in the per cent of fiber to seed.

**Sugar loaf.**—This cotton is said to be the variety from which "King" originated. It is very pure, every flower having the characteristic spot on the petals. The stalk is small, well shaped and the foliage is sparse. The bolls are very small and it matures early.

**How the Crop was grown.**—The land on which this crop was grown is a piece of first class bottom soil of a loam texture. No fertilizer of any kind was applied to it nor has there been since 1904.

One-half of the cut of land was given a good application of barn manure in 1904 and the whole then set in strawberries, blackberries, raspberries, etc. These plants remained on the soil till May, 1907, when the ground was cleaned off, plowed with a reversible disc plow and planted in cowpeas. The cowpea crop was turned under with a disc during the winter of 1907-1908. The land was cultivated with a disc harrow in March, rows laid off four and a half feet wide and bedded

The cotton was planted April 21, 1908, in one-row plots, repeating the plots seven times. The area planted to each variety was one-tenth of an acre.

A perfect stand was obtained. Most people who saw it thought the crop would have been better had it been thinner in the drill and if the rows had been wider.

The yield of cotton in the test was unusually large, and it must not be imagined by any one that it was the fine varieties of cotton planted that is responsible for the good crop. The soil and the cultivation given were vastly more important than the varieties of cotton planted.

Assuming that the poorest yield in this test is about equal to ordinary seed, the superiority of better varieties is shown by comparing the value of this variety with that of the best. Such a comparison shows a difference of slightly more than \$35.00 per acre or about 43 per cent better. Such a per cent increase might safely be expected on any quality of soil with these two varieties.

A point that should be considered in buying seed is the danger of sometimes getting those of inferior quality. This danger is due not so much to dishonesty in the seller as the natural tendency for seed to deteriorate in quality when care is not taken to make selection, each year, of the best to use in planting. Say, Mr. A buys some pure seed of a good variety and plants them. There is certain to be some variation in the plants; there will be some very poor stalks; a lot of bad bolls, half matured and too small; and possibly some diseased cotton. If Mr. A gathers the whole crop together and then adds to this some mixing of seed at the gin, he has undoubtedly not as good seed as he started with. Let this continue two or three years and the cotton has almost "run out." Mr. A might advertise this variety as pure and granting that he had been very careful about mixing at the gin and had grown no other cotton on his farm, his seed would undoubtedly be very inferior and would be a disappointment to the purchaser.

Every small farmer, at least, should select his planting seed for the following year. If this is not practical and it will not be in all cases, arrangements could be made with some reliable man who does select to furnish seed. A plan that has been suggested by a farmer in this county and is being practiced by him, is to buy a few bushels of selected seed each year, although he may have to pay a good price for them, and to plant an area in these that will grow sufficient seed to plant his whole farm the next season. This plan seems good as a practical proposition where reliable seed can be obtained, and I would suggest that other farmers follow it. If it appears too burdensome to follow this every year, it could be practiced every second or third year with evident improvement over the present method of planting. At present the trouble will be to secure reliable seed of undoubted superior merit; but the intelligent farmers of the State should be able in a few years to meet this difficulty; and further such a practice will lead to more people selecting their own seed. The difference in yields in this test may also be slightly misleading since some of the varieties were furnished by the originators and represent the very best of the variety. It not being possible to secure all of the varieties from the

originators, a few were obtained from seedmen, the purity of which is not vouched for.

For further information on selection of seed you are referred for the present to bulletin 113 of this Station on Varieties of Cotton for 1907.

**Weather.**—The rain-fall during the growing season for the different months was as follows:

|       |                               |
|-------|-------------------------------|
| May,  | 6.52 in., well distributed.   |
| June, | 5.84 in., well distributed.   |
| July, | 5.02 in., well distributed.   |
| Aug.  | 2.98 in., most of in 2d inst. |

September, October and November, less than 1 inch.

The seasons were entirely satisfactory except that it was too dry in August and September. One or two good rains during the latter part of August and in September would have increased the crop.

**Temperature.**—The temperature was good for the cotton crop. The first day of May was the only day that was too cool. On only three other days during May was the temperature below 50 degrees.

#### Where the seed were obtained.

|                       |                     |                         |
|-----------------------|---------------------|-------------------------|
| Cleveland Big Boll    | J. R. Cleveland     | Decatur, Mississippi.   |
| Cook's Improved       | J. R. Cook          | Ellaville, Georgia.     |
| Smith's Double Header |                     |                         |
| Russell Big Boll      | J. L. Thornton      | Alexander City, Ala.    |
| McKay's July          | J. F. McKay         | Jackson, Mississippi.   |
| Excelsior             | Excelsior Seed Farm | Cheraw, South Carolina. |
| Berryhill's Improved  | F. M. Berryhill     | Liberty, Mississippi.   |
| Christopher           | Mr. Christopher     | LaGrange, Georgia.      |
| Triumph               | J. F. McKay         | Jackson, Mississippi.   |
| Moss Improved         | Rev. B. D. Moss     | Norway, South Carolina. |
| Lewis' Prize          | W. B. F. Lewis      | Lewiston, Louisiana.    |
| Lowe's Improved       | S. A. Lowe          | Meridian, Mississippi.  |
| Peterkin              | J. A. Peterkin      | Fort Mott, S. C.        |
| Brandon               | L. L. Neyland       | Olio, Mississippi.      |
| Neely's Improved      | S. O. Neely         | Shubuta, Mississippi.   |
| Toole's Improved      | W. W. Toole         | Augusta, Georgia        |
| Tatum's Improved      | R. B. Tatum         | Palmetto, Georgia.      |
| Hawkins' Improved     | B. W. Hawkins       | Nona, Georgia.          |
| Sugar Loaf            | Sugar Loaf Farm     | Youngsville, N. C.      |
| Columbia              | J. W. Fox           | Greenville, Mississippi |



# Mississippi Agricultural Experiment Station.

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BULLETIN NO. 117.

DECEMBER, 1908.

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## COTTON CULTURE IN MISSISSIPPI

(In areas infested with the Mexican Cotton Boll Weevil.)

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By W. L. HUTCHINSON.

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**Introduction.**—The effect of the presence of the Mexican cotton boll weevil, in any section, is to shorten the season for making a crop of cotton by about one-fourth. This means that a crop must be made in weevil-infested areas in this state in from 100 to 120 days, and this, too, in the first part of the season. Perhaps, at some time, every cotton grower in this state has made a good crop of cotton in 90 to 100 days. This has been done in the Delta as well as in the upland sections, but in all these cases, perhaps, the crop was made during the last 100 days of the season instead of the first 100 days as must be the case under weevil conditions. Therefore, making a good crop of cotton in 100 days is not a new thing to Mississippi farmers—the new feature will be the making of the crop the first part of the season instead of the latter part.

It is a fact that the boll weevil does not prevent the growing of good crops of cotton. What he does is to prevent and make impossible the making of a late crop of cotton. Apparently farmers perfectly familiar with the growing of cotton could adapt their affairs to the growing of an early crop without any loss or without any serious disturbance of economic conditions, but such has not been the case with those farmers who have thus far had to meet weevil conditions. The greatest trouble comes when the farms are first infested with the weevils and the farmer persists in trying to make a late crop. Just as soon as farmers realize that they cannot grow a late crop, but can grow a good early crop, the problem is solved. The object of this bulletin is to put into the hands of Mississippi farmers such data as will enable them to produce a good early crop of cotton in weevil-infested areas.

Success depends essentially on good tillage, proper fertilization, the planting of good seed of a good early variety of cotton as soon as



weather conditions are favorable; and, properly cleaning up the farm of hibernating places for the weevils during the winter months.

**Early planting.**—Farmers cannot make a greater error than to think that an early crop depends solely or mainly on early planting. To plant cotton too early will be a mistake. Early planting should only mean to plant as soon as the weather is right. As early in April as the season or weather will permit will doubtless be a good rule for Mississippi.

**Tillage.**—Perhaps a good early crop depends more on the very best tillage than on any other one thing. It is important to keep the crop growing constantly, especially when the plants are young, and it is the young plants that stand particularly in need of a well-tilled soil. A firm, moist, fine soil free from clods or lumps of any size is what is wanted for a seed bed, but it is far more important to the young plants, and it is also best for older plants and this makes plain what good tillage means.

**Preparation.**—Plow the land well some weeks before planting time in order that the rains may wet it thoroughly and to give ample time for harrowing the plowed soil until it is fine and firm. A deep soil is desirable but deep plowing does not necessarily mean a deep soil, if the soil be plowed six inches deep it may be regarded as being well plowed and no fixed rule can be given as to how deep to plow various soils. Any depth greater than six inches may be regarded as deep plowing. I have seen land that was plowed too deep and I have seen land that was not plowed deep enough, but I never saw land that had been harrowed too much, though I have seen it harrowed and cross-harrowed five or six times. An effort should be made to harrow until the soil is in that condition of tilth most preferred by cultivated crops and more particularly necessary for the best welfare of young tender plants.

**Cultivation.**—Inter-tillage or cultivation between the rows of plants should have for its object to keep the soil in the same moist, mellow fine condition given it in the preparation. This is why the best preparation is sometimes said to make the crop before it is planted. If the land is properly prepared shallow tillage will keep it in the very best condition for growing crops. When the cotton is young is when it most needs the very best attention that can be given it with cultivator and hoe in order that it may grow constantly at this time, for it is at this time that growth is most apt to stop. If the land is prop-

erly prepared and the cultivators run as often as they should be run for best results, the farmer will not even want to use a turning plow in the cultivation of his crop. Whenever the turning plow is used in the cultivation of a crop no better evidence could be had that the crop has suffered for the want of proper tillage. The fact that the use of the turning plow in the cultivation of the cotton crop is quite general in this state is significant, and suggests that in this matter of tillage the boll weevil is going to find the greatest weakness of Mississippi farmers. If the cotton growers of the state can only bring themselves from a careless half-way tillage to the practice of the very best tillage that may be given the soil, the other conditions necessary to growing a good early crop of cotton will come comparatively easy. Good tillage is so helpful to a crop that its effects have been compared to that of manure, and if cotton farmers are to successfully meet boll weevil conditions they must know and practice the best tillage. Here is the vulnerable point of the cotton farmer and the boll weevil gets in his work of destruction because of it. Good tillage means good teams and good implements and after the land is well plowed the thorough cultivation of the soil with harrows and cultivators cannot be done too well.

**Soil Mulch.**—Good surface tillage of well prepared land has much to do with maintaining in the soil a desirable moisture content and this in turn has much to do with the constant and steady growth of the plants. Good yields and early crops are promoted by keeping the plants constantly growing. Any covering for the soil tends to keep it moist and mellow, and the practical way to do this is to use the first two inches of the surface as a cover, or mulch. The frequent use of the cultivator does this.

**Fertilizers.**—The rational use of fertilizers is an easy thing and Mississippi farmers need not err in this regard. The four experiment stations in the state have made a great many experiments with fertilizers and rational fertilization is a simple proposition.

The upland or hill sections, to include the sandy-loam soils of the long leaf pine belt and the oak and hickory uplands; and the brown silt-loam, through which runs the I. C. R. R., should use a mixture of cottonseed meal and acid phosphate. The mixture should contain one-third cottonseed meal and two-thirds phosphate. Such a mixture represents the type of fertilizer that should be used. Potash may be left out. The farmers of this state are annually wasting more than \$100,000, in the purchase of Potash from which they derive no benefit.

From two to three hundred pounds of fertilizer to the acre will, as a rule, give the best profits. The fertilizers should be applied in the drill immediately under where the seed are to be planted and the Stations have gotten best results by applying all the fertilizer at one time.

In the Delta neither Potash nor Phosphates have helped the crops, but on the older and lighter lands cottonseed meal has increased the cotton crop enough to pay. The heavier buck-shot soils have not responded to fertilizers. A crop of cowpeas is the best thing to improve the soils of the Delta.

Where fertilizers increase the crop to a profitable degree they also make the crop earlier—perhaps two weeks earlier as a rule.

**Varieties.**—While tillage may be the principal thing the variety of cotton planted, and the care that has been used in the selection of the seed, have much to do with the growing of a good early crop of cotton. One variety may be fifteen to twenty days earlier than another and this means much when every day counts for profit or loss.

It matters not what the good qualities of a late variety may be it is not desirable under boll weevil conditions. Let farmers realize that whenever the farm is thoroughly infested with weevils a late crop is out of the question. Don't invite bankruptcy by trying to grow a late crop. A late crop is a boll weevil's crop, not a farmer's crop.

Cleveland big boll and Cook's improved (short staple), are two of the best varieties for Mississippi farmers to grow under boll weevil conditions. Both are early, fifty to sixty bolls make a pound; the fiber is about one inch; both yield a high per cent of lint, Cook's being best on this point. Both varieties yield well, heading the list for yield in comparison with both early and late varieties. Except where staple cottons are grown they are the two best varieties, either with or without the weevil.

Russell big boll, Triumph and Smith's Double Header are three varieties with slightly larger bolls than either Cook or Cleveland, and they have a fiber of 1 1-16 to 1 1-8 inches. They are reasonably early.

Prize, King's improved and Toole are three varieties with small bolls that may be used under boll weevil conditions because of their early maturity.

But of more importance than any variety is the careful and intelligent selection of seed each year. Seed for planting should not be saved from diseased or otherwise undersirable stalks and such



stalks will appear in every cotton field. Only those who have seen this done realize its real value and importance in growing a good early crop of cotton.

**Wide rows.**—As shade is favorable to the rapid increase of the weevils, during the cotton growing season, the rows should be wide enough to prevent the cotton meeting between them in order to allow the sun's rays to interfere with the increase of the weevils as much as possible.

**A well-kept farm.**—If cotton farmers are to make a crop in weevil infested areas they must have neat well-kept farms. The average Mississippi farm shows the neglect of a step-child.

The winter weather kills a great many weevils—most of them, in fact, but some always hibernate through the winter and the poorer the farm is kept the more weevils there will be the next spring as bushes, briars and similar rubbish about the farm furnish the weevils protection from the cold.

Start each crop with as few weevils as possible. The less protection the weevils have for winter the smaller number there will be the next spring. Of all the things the farmer can do to lessen the number of weevils, cleaning up the farm, to include burning the stalks as soon as the crop is gathered, during the winter months accomplishes most. One pair of weevils less in the spring means millions less later in the season.

Clean up the farm until it is as neat as a pin and make an early crop of cotton. Success will be in proportion to the thoroughness with which the cleaning is done and the ability manifested in growing an early crop.

**Drainage.**—Poorly drained land cannot be planted early, hence the advent of the weevil emphasizes strongly the necessity for draining all bottom lands so that water will not stand still. All water that will not soak into the soil promptly should be made to run off promptly.

Broad shallow ditches made with a plow and triangle or with a plow and dump scraper are very much more satisfactory than those made with a spade. Ditches made with a spade make first class hibernating places for weevils; cause an appreciable loss of land, and give comparatively poor drainage. The broad shallow ditch referred to above is better for drainage and permits of perfectly clean culture thus preventing grass, weeds, bushes and other growth from furnishing hibernating quarters for weevils.



**Planting seed.**—It takes several million bushels of seed to plant the crop in Mississippi. Such a supply cannot be furnished by seed houses and a few growers. If a farmer would have good seed of a good variety with which to plant his crop the sure way and, perhaps the only sure way is to furnish them himself. He may buy enough from some grower to plant a patch, but a few plantations can exhaust the supply of any store or grower. Mississippi cannot possibly get enough good seed of the best-varieties to plant the crop of the state sooner than they will need them.

**Hostile conditions.**—Evidently one reason why the weevil is worse in newly infested territory is because he finds there much better hibernating quarters. As the weevil invades new territory let him meet hostile or unfavorable conditions at every point. Perhaps the best year of all for cleaning up the farm and for making an early crop and for an early destruction of the cotton stalks would be the year before the weevil comes. Let him find the farmer ready for him, and his first injuries will neither be so great nor so easy.

# Mississippi Agricultural Experiment Station.

BULLETIN No. 118.

## CLEARING PINE LANDS.

By E. B. FERRIS.

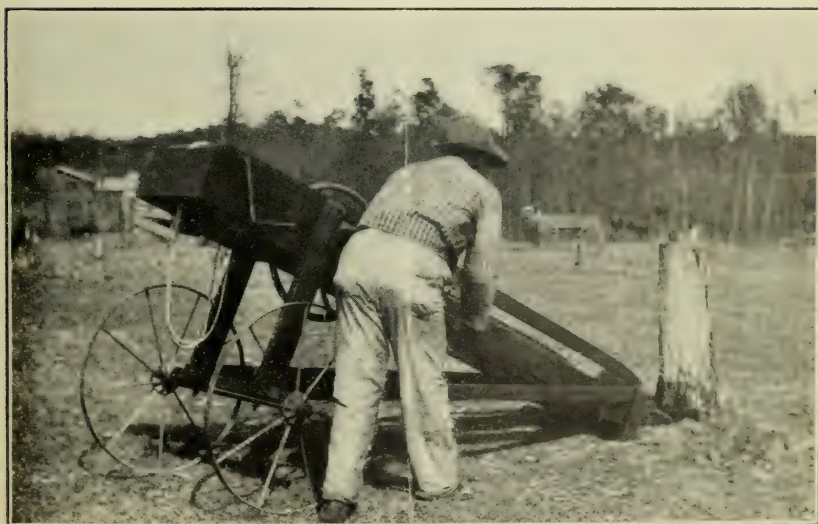


FIG. 1.—The Day Boring-Machine.

AGRICULTURAL COLLEGE, MISSISSIPPI.

JANUARY, 1909.



# CLEARING PINE LANDS.

BY E. B. FERRIS.

**Introduction.**—Practically one-third of the area of Mississippi is embraced in what is known as the Long Leaf Pine Belt, so called because the soils have now or once had a growth of long leaf pine on them. Large portions of many of the other states bordering on the Atlantic Ocean and Gulf of Mexico are, or once were, covered with similar pine forests. The clearing of these lands for agricultural purposes is quite a problem in this state at the present time when such large areas have been denuded of their growth of timber and await development at the hands of the farmer. There is no longer a doubt but that the most of this area, when cleared and properly handled, will make some of the most valuable farm land in the state, but the cost of clearing (largely the removal of the stumps) has discouraged many a prospective settler.

As a rule it is quite an easy matter to get these lands free from logs and tree-tops, for the saw mills use everything that will make merchantable lumber and in many instances, when the lands are reasonably near a railroad, the wood and charcoal men will use everything else, leaving practically nothing in the way of the plow except the stumps. The removal of these stumps is really the serious problem about clearing pine lands, for unlike the hardwoods and many other pines, the stumps of the long leaf pine do not decay very fast, many of them being almost as resistant to decay as bronze.

**Cultivating pine lands.**—Heretofore a great deal of the land in this section of the state has been cultivated without first removing the stumps. The surface roots of the pine are very brittle and except for the stump and its tap root it is comparatively easy to cultivate pine lands even for the first year. As a rule the majority of the small farmers in this section depend on a single mule and Georgia stock to do their breaking and cultivating and have not been handicapped by the stumps as they will be when more up-to-date methods are adopted. If, however, the farmer considers his own and the labor of his family as being worth very much, he will find that he cultivates stump lands at a great sacrifice and that there is nothing more than a bare living to be made at it. There are several reasons why this is true, as follows:

1. He cannot by the use of improved implements and machinery substitute mule power for man power in cultivating and harvesting



his crops and the day is past when the hoe and scythe can compete with the cultivator and reaper.

2. Yields will be reduced each year from ten to twenty per cent by space lost on account of the stumps. The average land in this section will have about one hundred stumps to the acre and a space of fifty square feet is easily lost around each stump.

3. Grass is sure to grow around these stumps unless hoes are used to remove it during the entire year, and in doing so grass seeds are scattered over the entire field, necessitating additional hoe work with every crop.

**Removing stumps.**—The McNeill Experiment Station has removed the stumps from one hundred acres of land, using all known methods, and keeping sufficient data to determine approximately the cost by each method. Fifty acres of this land was cultivated several years before removing the stumps and this experience led us to the conclusion, expressed elsewhere,<sup>7</sup> that it is far better to remove the stumps before the land is put into cultivation. This is true because the lands cannot be cultivated economically with the stumps on them and also because the tree-tops, knots, etc., on the uncleared land will serve as fuel for burning the stumps and save the cost of hauling it.

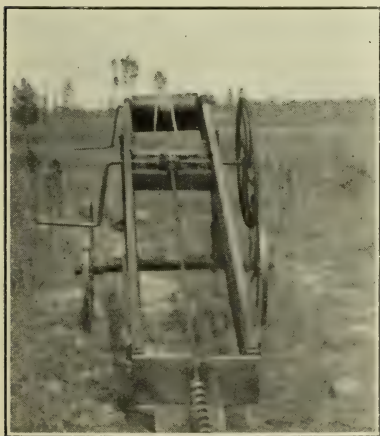
**Digging and cutting.**—This is a sure method of removing the stumps if persisted in, but under our conditions has proven the most expensive one except for stumps ten inches or less in diameter, or for certain lands that have been in cultivation a long time and the stumps are partially decayed. In clearing land here we have found many stumps on every acre that would require five hours each to dig around and cut them off eight inches beneath the surface of the ground.

**Burning.**—We believe the best method of removing stumps at the present time is to burn them. This will likely remain true until the crude products in the stumps will pay for pulling them and getting them to the factory. The common method of burning these stumps is to dig a hole about twelve inches deep with spade or post hole digger on one side of the stump, as close to it as possible, and to use this as a furnace for firing the stump. In digging these holes it is necessary that the dirt be removed from as much of the surface of the stump as possible so as to allow the fire to come in direct contact with the side of the stump for at least six inches. An ordinary turpentine dipper on a suitable handle makes one of the best implements for removing this dirt. Burning stumps by this method is rather a slow

*Process*  
operation, but in the hands of careful workers is practically as cheap as pulling them, besides it can be engaged in by a single individual without the expenditure of more than two dollars for purchasing the necessary implements. In burning the stumps by this method the object should be to keep the fire going in each furnace by using as little wood as possible and this, to consist as largely as possible of knots that furnish a high heat, are entirely consumed, and consequently do not fill up the hole beside the stump as the bark and trash would do. After the stumps are thoroughly heated and ignited we have found it very helpful to use ordinary poles of any kind to assist in burning them, standing the poles diagonally into the hole and well against the stump at the lower end and keeping them pushed down as this end burns away.

**Boring and burning.**—The burning of stumps by the above method may be greatly hastened and facilitated by boring an auger hole diagonally through the stump from a little beneath the surface of the ground on one side into the post hole or furnace on the opposite side. This serves as a flue through which the heat and flames pass out of the furnace, heating the stump to its ignition temperature in less than one-fourth the time required without it. After a stump thus treated becomes thoroughly heated it usually burns out with very little more effort on the part of the attendant and in most instances to a sufficient depth beneath the surface to be out of the way of plows or cultivators. A machine that puts a two-inch hole through a stump at the rate of twelve inches per minute while actually boring has been invented

by J. W. Day of Crystal Springs, Mississippi, and may be constructed at a cost of \$25.00 or less. This machine is shown in the accompanying figure.



A two-inch ship auger is welded on to one end of a three-quarter inch iron rod six feet long. Four inches from the other end of this rod a collar is welded and the end of the rod passed through an iron box fastened to a movable frame about eighteen inches square. A bevel gear is then fastened to the extreme end

of this rod either by a key or set screw and works into a second gear of



the same kind fastened on a horizontal shaft. This horizontal crank-shaft is made of one inch iron rod bent at one end to form a handle, with a fly wheel fastened on the opposite end. It works through two boxes fastened to the movable frame and slides down the main frame as the auger bores into the stump. The upper end of the machine is elevated about five feet and stands on two cart wheels on which it is easily rolled from stump to stump or from field to field by a single individual. This elevation of the frame helps to brace it against the stump in boring, raises the crank shaft to a height at which it can be most easily turned, causes a slight pressure to be constantly exerted against the auger and makes it possible to bore the hole diagonally into the stump. At the extreme upper end of the frame is a small windlass with ropes attached which is used for pulling the auger out of the stump. This machine is quickly adjusted to the stump and in a test made here one laborer in five hours bored through twenty-seven stumps that averaged eighteen inches in diameter at the top and twenty two inches diagonally through as bored.

The machine just described and illustrated is an exceedingly simple one and could be duplicated by most any farmer who had the auger, rods, gears, and oil boxes. Removing stumps by this method has been decidedly cheaper than by any other method tried, and as it requires only a small expenditure for machinery, practically no repair bills, and can be operated by a single individual, it ought to appeal strongly to the small farmers of this section.

**Blasting.**—A quick and fairly satisfactory method of removing stumps is by first blasting them with dynamite and then burning the shattered remains. As most people know, dynamite is a preparation of nitro-glycerine mixed with sawdust so as to get it into the form of a solid. It is mixed in several proportions, but the kind most used for blasting stumps is that containing 40% of nitro-glycerine. This dynamite is moulded into sticks which are one and one-quarter inches in diameter by eight inches long, each stick containing about one-half pound and costing about seven and one-half cents. With each charge of dynamite a blasting cup must be used which costs about three-quarters of a cent and also from six to ten inches of fuse which costs about sixty-five cents per one hundred feet. It requires from one-quarter to one pound of dynamite to shatter the general run of pine stumps, making the cost of blasting alone from five to twenty cents per stump.

In order to shatter these stumps with this amount of explosive it is necessary to place the dynamite into holes bored well into the

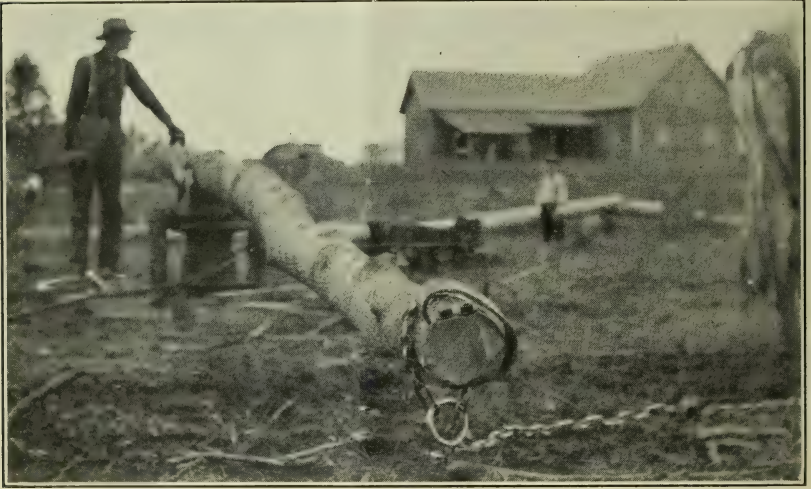
body of the stump and to tamp same thoroughly with sand or clay. One and one-half inch augers have been used here to bore these holes, starting them at the surface of the ground on one side and boring diagonally down into the stump from ten to twenty inches, depending on the size. Effort should be made to so place these holes that the pressure from the explosion will be exerted equally on all sides of the stump, otherwise it will simply blow out the weakest side and fail to shatter the stump. The Day boring machine recently mentioned can be used very effectually for boring these holes, reducing the cost over hand boring at least fifty per cent. There is an element of danger in the use of dynamite, but a very slight one if even ordinary precautions are used. The station has used thousands of pounds of it within the past seven years without the slightest accident, the only disagreeable feature of the work being frequent headaches caused by inhaling the fumes from an explosion or by allowing the dynamite to come in contact with any part of the mucous membranes. The greatest danger in handling dynamite is in cold weather. It freezes at a temperature considerably above that of water and in the process of thawing is liable to explode accidentally.

**Stump-pullers.**—There are two kinds of stump pullers, those that pull the stump to the side and those that lift it vertically out of the ground. As many of the tap roots of these pine stumps are as much as ten feet long and taper gently from the surface of the ground to the end under the ground, it seems evident that the force required to lift them vertically would be much less than that required to pull them from the side. Whether the application of the force to the vertical pull can be made as economically as that to the side pull I do not know. It is certain that the most of the stump pullers on the market pull from the side. These, however, have been made for pulling other than tap-rooted stumps and this likely accounts for this fact.

The station bought a stump-puller at one time on trial; it was a heavy machine, so much so that it was difficult for two good mules to move it from one anchoring stump to another. A good machinist was put in charge to operate it with two good mules to do the pulling and several additional hands to handle the cable, pulleys, etc. The machine was a No. 2 "Faultless" manufactured by a firm in Cresco, Iowa, and cost about \$155.00. It was, however, too light to do the work, though in every other respect a most excellent machine. With it we were not able to pull even the medium-size stumps without first digging around them and cutting the lateral roots, so after two weeks the machine was sent back to the factory. A machine constructed



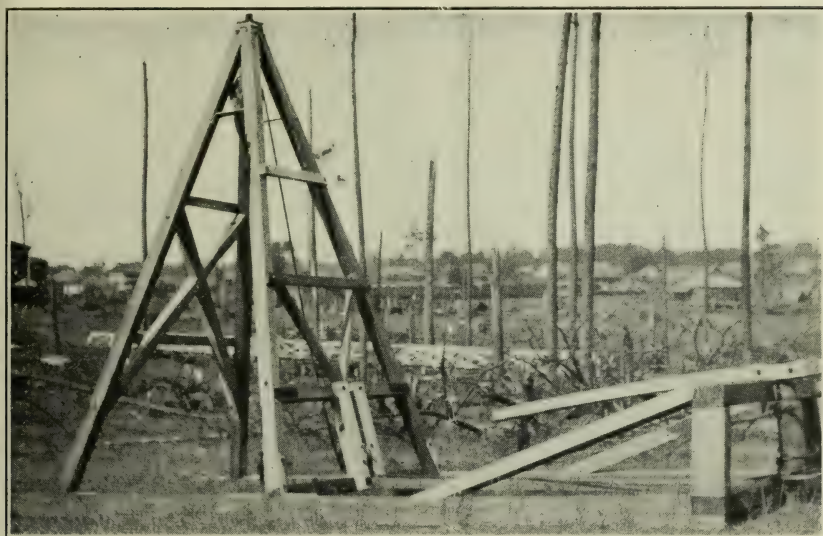
on the same principle as the one used here but one size larger, has been used successfully to pull pine stump in this section. Such a machine costs about \$200.000, requires from two to three yokes of oxen and four or five men to operate, and will pull an average of about fifty stumps a day.



Mr. P. M. Ikeler, of Moselle, Miss., has cleared a lot of land using the stump-puller shown in the accompanying illustration. He found it advisable to blast his largest stumps rather than take the chance of breaking a cable in attempting to pull them. Mr. Ikeler writes that he is now burning out his stumps by digging a post-hole by the side of them and thinks this method cheaper than pulling, especially where the land has trash on it with which to burn the stumps.

A machine to pull long leaf pine stumps must be very heavy and therefore difficult to move from place to place. A stump-lifting machine made by Mr. W. R. Wilkinson, of Claxton, Ga., is said to move any size stump. It lifts by screw power, weighs 2,500 pounds, and sells for \$200.00. It requires two men to operate it, one mule to pull the stump up, and two mules to move the machine from one stump to another. With this force from twenty to thirty stumps are said to be pulled per day, the holes being filled as the stumps are lifted out of the ground.

A machine has recently been invented by Mr. J. T. Purvis, of Purvis, Miss., that lifts the stump out of the ground by means of a wire cable working through a system of blocks and pulleys and wound



around a capstand. The machine is quite a simple one and is made by taking two pieces of 4x8x18 and placing them on the ground parallel to each other and about six and one-half feet apart. These serve as runners on which the machine is moved from place to place. On one end of these runners a derrick about twelve feet high is built of 4x4, and on the opposite end a cap-stand is securely fastened and turned by a lever about ten feet long. The writer has never seen the machine at work, but has understood that with a few simple improvements now being made it will be worked successfully.

Machines that lift the stumps vertically have to be moved every time a stump is pulled, while those that pull from the side have a decided advantage in this respect. Another disadvantage in the vertical lift is the difficulty of getting a hold on the stump to pull by, and this difficulty will be increased with either kind of stump puller as the saw-mill men come more and more to cutting their stumps at the surface of the ground.

After stumps are pulled they are still quite as much in the way as they were in the ground and their ungainly shape makes them extremely hard to handle. They are very heavy and it will require a team of four mules or six oxen to move and pile them. All such work is very slow and admits of much idling on the part of those engaged in it.

**Other methods.**—Several other methods of removing stumps have been suggested as being practical and have been tried here. One

of these was to bore an auger hole into the stump and fill it with nitrate of soda, another to fill such a hole with kerosene oil, and still another to fill this hole with strong acids, such as nitric and sulphuric. We hardly think either of these methods practical. Nitrate of soda will only rot a long leaf-pine stump slowly, if at all, and an experiment tried here with it apparently showed no advantage whatever from it. As a rule these stumps are full of crude turpentine and are very inflammable when enough air can be gotten to them to support combustion. It would seem, therefore, that the logical end to work to would be to get a free circulation of air through the stump while it was being burned, and the auger hole accomplishes this result as nothing else has done.

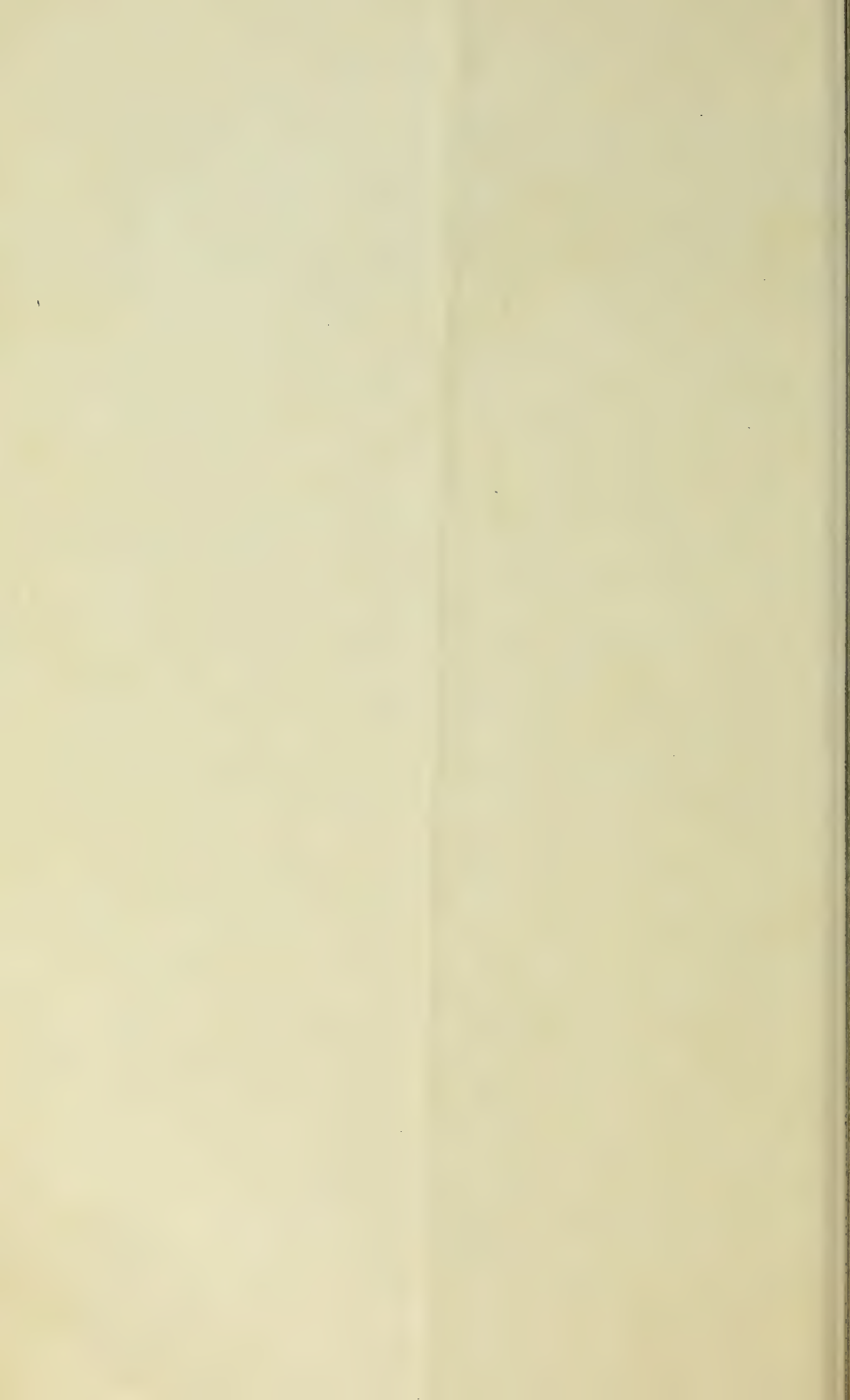
**Cost.**—It is usually cheaper to clear the land of stumps before it is put into cultivation and before the tree tops, knots, etc., have been removed, because by any method, even though the stumps are pulled, it will require more fuel to burn them than is contained in the stumps themselves. In 1902 this station removed the stumps from thirty-five acres of land, largely by blasting and burning. This was before the land had been brought into cultivation and all the fallen timber was used to pile around the stumps after they had been blasted and the roots exposed by digging around them. The cost of clearing this thirty-five acres ready for the plow was at the rate of about seventeen dollars per acre. This was before we got a boring machine, when the cost of boring for blasting averaged well above two cents per stump.

We did not get one of these boring machines until the spring of 1908 and soon after that began an experiment to determine the cost of removing stumps by boring and burning. The land selected had been cut over about seven years before and the most of the sap wood had decayed, but the balance of the stump above the ground and all of it beneath the ground was as solid as when the tree stood on it. There were 2.3 acres of this land selected for the experiment and on it there were 158 stumps that had to be bored and 65 that were small enough to be removed with spade and axe. The 158 stumps averaged 13.6 inches in diameter at the top and the diagonal holes that were bored through them averaged 19.7 inches. It required about three days for one man to bore the 158 stumps, about half this length of time for another hand to dig the post holes and prepare the stumps for burning, and about five days for one hand to burn out the stumps. It required at least a day and a half to cut out the small stumps, and about another day to cut off the corky parts of the stumps that failed



to burn. A little wood had to be hauled, but the most of the burning was done with the stumps that were cut up and the tops of others that had burned off beneath the ground. Reduced to cost per acre this amounted to less than eight dollars, allowing \$1.50 a day for the labor. As stated before the cost of removing stumps by this method has been decidedly cheaper than by any other method tried.





# Mississippi Agricultural Experiment Station.

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BULLETIN NO. 119.

MARCH, 1907.

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## REPORT OF WORK AT THE DELTA STATION FOR 1907-8.

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BY J. W. FOX.

This bulletin gives a summary of the work at the Station for three years, and conclusions given are the result of our experience covering that period, unless the statement is made for a particular season. The three years vary greatly as to rainfall and temperature during the growing season.

The season of 1906 was favorable for both cotton and corn. Heavy fall rains and wind damaged both crops to some extent. The season of 1907 was extremely unfavorable to both cotton and corn through March, April and May. The temperature was much below normal. During June, July, August and September the conditions were very favorable. 1908 was a wet year and an unfavorable crop season in our section. The three years will average as somewhat unfavorable for this immediate section.

We have 200 acres in cultivation on the Station farm. In 1906 about one-fourth of the land was rented under a contract which existed when the land was purchased. During 1907 and 1908 the cropping system was approximately as follows:

- 20% of the land grew corn and peas,
- 44% cotton,
- 18% hay crops,
- 5% hog pasture,
- 5% Bermuda pasture,
- 1% young orchard,
- 1% truck crops,
- 6% various experimental crops and driveways.

The hay crops consisted of oats and wheat (followed by cowpeas), alfalfa, red clover and sorghum. The corn land was planted in peas just before the last working and the peas grazed off with hogs. Thus about one-half of the land is being improved each year.

It is proper to state that the Station property was an old run down cotton farm. No attempt had been made to keep up the fertility of the soil. Twenty per cent of it was too wet to cultivate profitably. The above rotation was planned with a view of producing each year money crops, supplying the place with its feed, and, at the same time, improve the land.

CORN.

The corn was planted on the unimproved part of the place. This was done in order to fertilize the land with peas.

The average yield without fertilizers has been thirty-nine bushels per acre. On five acres in 1908, planted after corn and peas the previous year, an average of forty-seven bushels was made. On one acre fertilized with ten loads of stable manure and 300 lbs. cottonseed meal, the yield was seventy-two bushels.

Time of planting.—For loam land, well drained, the first twenty days in March is a good time to plant. For stiff land and land that is not well drained we have had better results with that planted the latter half of May. If planted during the intervening period, insects, especially the Bud worm, are liable to damage the stand.

Method of preparing the land.—For early planting, we have practiced two methods. Both have given satisfactory results. On particularly well drained cuts, where there is a gradual fall and no depressions, and much of the Delta land lies this way, the land may be flat broken during the winter. At planting time disc it, setting the disc at a sharp angle and half lapping. Weight the disc harrow if necessary so that it will cut deep. Follow with heavy smoothing harrow, cross harrowing if necessary, and plant level.

The second method is better for land that has not perfect drainage. It consists in breaking the land in eight-foot beds. When ready to plant, run the disc harrow on the bed and follow with smoothing harrow. Plant two rows on each bed. This plan provides drainage for one side of each row. Also, the land will be practically level when corn is laid by.

For May planting, break early and either re-break in April or keep land well disced and harrowed to keep the land free from grass and in good condition to plant. Plant level at this season.

Cultivation.—Corn may be drilled or checked. We prefer checking for two reasons. The corn can be kept clean with less labor, and, after our heavy spring rains, the land can be more thoroughly cultivated by plowing both ways. It can be checked on the double bed, referred to above, by taking up the marker and driving the planter down the center of the bed. We use the double walking cultivators. These do thorough work and the cost of making the crop is cheapened. Corn should be cultivated often and thoroughly. Cultivate deep during the early part of the season and shallow after the roots get out in the row. After the corn is too large to permit the use of the double cultivator, for the last plowing, we use single cultivators. Cultivate late. This conserves moisture and keeps the grass out. Sow one bushel of peas per acre just before the last cultivation.

Varieties.—It is very important that Southern grown seed be used. Northern seed should never be used except for early feed. Southern grown seed will make more corn, and sounder corn, and the weevils will not trouble it as they do the corn grown from the Northern seed. Certainly all the corn used on the plantation should be grown. Not only can it be raised much cheaper than it can be bought, but we must have the peas to put humus and nitrogen into the soil. Further, if the farm is fenced, the pea crop can be harvested by hogs, and a considerable revenue derived. By a test in 1908, the details of which are given in revised bulletin No. 107, \$10.00 per acre was made by grazing a corn field with hogs.

The statement is frequently made that corn is not a profitable crop in the Delta. If the land is indifferently prepared and the cultivation of the corn neglected for that of cotton, as is frequently the case, this statement may be true. That it is not necessarily true, many good Delta farmers have already thoroughly demonstrated.

HAY CROPS.

Oats and Peas.—One of the most satisfactory hay crops which we have grown is fall sown oats followed by cow-peas. This can be relied on as a perfectly safe crop for this section. Red Rust Proof seed oats should be used, and the crop should be seeded in October, or early November. The oats are cut with the mower, when just coming into the dough stage. They are ready to harvest the latter part of May. The land is then either plowed or disced both ways, and harrowed, and the peas planted either broad cast or in drills three feet apart. We prefer the latter method. We usually cultivate twice with double cultivator. The seed saved by this method will

more than off-set the cost of cultivation, and more hay of a better quality can be made. A better seed crop is made by drilling and cultivating.

The average yield of hay from the two crops for the season has been three and one half tons. On an acre of oats planted after corn and peas, 5,200 pounds of hay was cut. The yield of pea hay has been as high as 4,600 pounds per acre. Oats should follow cotton rather than corn and peas. They are liable to lodge if sown after a heavy pea crop. Further, this gives a saner rotation, as it gives cotton after peas. The entire crop of cotton could not be harvested in time to put in oats, but a sufficient area could be picked out for this purpose.

Oats would be profitable as a grain crop in connection with the pea hay crop following. Oats may be followed by corn or cotton the same season, but this is not advisable, as too great an area is already being planted to an exhaustive crop. As an experiment in 1907, five acres of oats was followed by cotton. The cotton was planted the third day of June and was fertilized with 300 lbs. cottonseed meal per acre. The yield was 508 pounds of lint per acre.

Alfalfa.—From three years experience with alfalfa, we do not hesitate to recommend it as a profitable hay crop if planted properly on the right character of land. Our average yield has been 6,600 pounds of cured hay per acre. The yield on fresh land or land improved by peas will be greater than this.

Well drained buckshot land is best suited to alfalfa. Fall planting is much safer than spring planting. In fact, spring planting will mean failure, generally, in this section. Fresh buckshot land not badly infested with crab grass, might be successfully planted in the spring, but even on such land fall planting is much safer.

The land should be thoroughly broken in winter or early spring, put it into thirty-foot lands. Sow to peas, thick in April, and mow for hay in July. Immediately plow the land, break thoroughly, and keep the field in lands as originally plowed. Keep well disced and harrowed until about September 1st, and plant. If the land is prepared in this way, we will have no fall too dry for seeding.

Twenty pounds of seed per acre is abundantly sufficient. Cover with smoothing harrows.

Inoculation.—A few bushels per acre of finely pulverized soil from an established alfalfa field, sprinkled over the ground when the seed are sown, will greatly help the growth of alfalfa. This inoculation is not absolutely essential for our stiff lands, but it will cause a vig-

orous growth from the start, and is worth while, even on this class of soil. For loam land, inoculation is essential to success. Some planters are growing alfalfa successfully on loam land, without artificial inoculation, but it is after the crop has been plowed up and re-planted one or more times, or after the field has become inoculated of itself.

We strongly insist on fall planting, early fall planting, and, also, that the ground be broken from four to six weeks before time to plant, and kept well harrowed until planting time. Alfalfa will not grow if planted on freshly plowed land. A well broken but firm soil, with the upper two inches well pulverized, is the ideal seed bed.

We suggest inoculation for all Delta soils, and insist on it for loam soils.

Alfalfa will yield for us from three to five tons of hay per acre, is easily cured, and is worth 25 per cent. more than timothy for feeding to farm stock. Timothy gets its high market value from the fact that it is an excellent feed for livery and fast driving horses.

If, therefore, you are paying \$16.00 per ton for timothy hay to feed to your farm teams, alfalfa hay, or cow pea hay, is worth \$20.00 per ton, and should be so figured in planning the crop rotation.

Sorghum.—For wet land that is unsafe for corn or cotton, we advise sorghum for hay. Break broadcast in broad lands and sow three bushels of seed per acre in May or June. Cut for hay when heads begin to turn brown.

Wheat and Hairy Vetch.—Sown together in the early fall, this makes excellent winter grazing and also makes a good hay crop if stock are taken off about the first of April. The crop should be cut for hay when wheat is just coming into the dough stage. It can then be followed by cow peas. A beardless variety of wheat should be sown.

Red Clover.—Red clover grows well on both loam and buckshot land. We use it in connection with rape for a hog pasture. We have also harvested good hay from it, but in view of our other more suitable hay plants, we do not advise its general use as a hay crop. On the loam land, the stand is broken during the hot weather of August and it is necessary to re-seed each year.

Another source of hay in the Delta is the pea crop grown in corn. This is harvested after the corn is pulled and makes a fine quality of forage. We do not practice this method, however, but let the hogs eat the peas, or pick them for seed, and then turn the vines under for fertilizer. At least two thirds of the fertilizing value of the pea crop is in the vines and seed and the remainder in the stubble and roots.

With our variety of hay plants, it is not necessary that a single bale of hay should be shipped into the Delta. When it is done, it is simply a matter of choice, the planters preferring to raise cotton to buy hay.

COTTON.

The important relation that cotton bears to Delta farming can hardly be overestimated. That it is the greatest staple money crop that can be grown in any section of our country will not be denied. This fact has led to our one crop system, which, of course, is wrong both in principle and practice, not only for our section, but for any section. The single crop system is not peculiar to our section. In every farming district there is some one crop which pays better than any other, and it is a matter of history that this crop has been raised to the practical exclusion of all others as long as the fertility of the land would permit. Diversification has come to those sections as a necessity and not from choice.

We do not advocate the exclusion of cotton from our cropping system, nor do we fear that any one thing, nor a combination of circumstances, will ever cause it to become an unprofitable crop. It is only when we come to regard it as the principal surplus money crop, after the farm has been made self-sustaining, so far as all feed crops are concerned, and the subordinate money crops selected always with the view of preserving the fertility of our lands, that our Delta will come into its own as the garden spot of the agricultural world. It is then that our lands will be worth \$150.00 and \$200.00 per acre, as their wonderful fertility amply justify.

Yield.—During the three years, we have cultivated 231 acres in cotton, and have harvested 115,250 pounds of lint. This gives an average production for the entire period of 498.9 pounds of lint per acre. In 1906 the area in cotton was 53 acres and the yield was 467 pounds of lint per acre. In 1907 we cultivated 90 acres and the yield was 539 pounds. In 1908, the area in cotton was 88 acres and the yield was 477.2 pounds per acre. Approximately 25% of the acreage was in cotton from 1 3-16 inches to 1 7-16 inches in length, and the remainder in short staple. About 40% was fertilized with 300 lbs. of cottonseed meal per acre, 20% followed corn and peas, and the remainder was not fertilized and was grown on land that had not been improved except as to drainage and cultivation.

Cultivation.—It must be remembered that the land under discussion is old land which had not been well plowed. For new land,

this method of preparation, and, to a certain extent, the cultivation should undoubtedly be somewhat different.

Where cotton was to follow cotton, the land was generally bedded in the winter or early spring. Our aim is to have the beds thoroughly settled and firm before planting time. The entire ground was broken, usually with six furrows to the row. Some cuts were flat broken early. In the latter case, a short time before planting, the land was laid off in rows with three mules to a ten-inch middle burster. The advantage of this latter plan is that the land can be more thoroughly broken. The disadvantage is, that should the spring be wet the land does not dry out as quickly as when bedded, the temperature is lower, and, therefore, the time of planting may be delayed. For an early crop, undoubtedly, the better plan is to put the land up into as high beds as possible some time before the planting season.

At planting time, heavy harrows are run ahead of the planters and the beds knocked off until they are only about half as high as is generally customary to have them. If the harrow does not sufficiently reduce the height of the beds, a drag is used. This planting on a low bed we think very important. The cultivation can be more nearly level, thus conserving moisture in the summer, when it will be needed. The first cultivation is given as soon as possible after the cotton comes to a stand. Either the double cultivators, with the fenders attached, are used, or a single cultivator, made similar to a side harrow. The hoeing is done after the cultivators. We do not use turning plows to "bar off" cotton except in extreme cases. Where cotton is barred off with the turning plow, particularly if it is closely done, as is generally the case, too much dirt is taken away, it falls down after the hoes, and the growth is checked. If no other damage is done, the crop is made several days late. However, if the crop gets in the grass because of too much rain, or from any other unfortunate cause, the turning plow is to be relied on and used freely. In such a case the two horse middle burster is also an excellent implement.

The cultivation is continued as rapidly as necessary to keep the soil stirred and the grass subdued. The double cultivators are used principally. During the early part of the season two horse middle bursters are used as needed to keep middles clean. Later they are laid aside and the five-toothed cultivators, single horse, are run in the middle if necessary. The cultivation gets shallower as the roots of the cotton get out in the row. Small buzzard wing sweeps are used on the double cultivators. After the cotton gets too large to plow with the double cultivators, single cultivators are used. The cultivation

is continued until the cotton is locked in the rows. Cotton can hardly be cultivated too late provided it is plowed very shallow so as not to disturb the roots.

The most critical part of the cultivation of cotton is the latter part. After bolls begin to form, with heavy foliage, it needs moisture in abundance. If the cultivation is stopped too soon, the ground bakes and the moisture evaporates. If cotton is plowed at this time with a turning plow the ground also dries out, and the roots are cut. With the heavy top and crop of bolls to support, the reduced root system cannot supply the plant food and moisture. To restore the balance, the plant sheds its forms and young bolls. Much of the August shedding could be prevented by late cultivation.

While we believe old land that is deficient in humus and nitrogen should be thoroughly and deeply prepared in order that every possible pound of plant food be made available, new land abundantly supplied with humus and with an excess of nitrogen should be treated in a different way. This land will grow too large a stalk. By very shallow preparation, plowing just as little as possible, in order to make a seed bed, and cultivating very shallow and no oftener than is absolutely necessary to keep down the weeds, less plant food will be made available, there will be less moisture for the cotton and the excessively large stalk will be avoided.

Spacing.—It is not possible to say just how much distance cotton should have, because of the difference in the fertility of soils. On our old land, which is producing about one bale per acre, rows four feet apart with the cotton about $2\frac{1}{2}$ feet in the rows has given the best results. Wider spacing has caused a lessening of the yield. As the land is made richer more distance will be necessary.

Checking cotton.—In 1908 we planted thirteen acres of checked cotton. The land was in corn and peas the previous year, the peas having been grazed off by hogs and the vines and stubble turned under in January. It was disced and harrowed in April and again in May. The cotton was planted level $3\frac{1}{2}$ feet each way, with a two-row combination cotton and corn check planter, the 23d of May. A good stand was secured. It was thinned to one stalk to the hill on a part of the cut, and to two stalks on the remainder. It was plowed both ways with double cultivators. The last two plowings were given with the single cultivators, one trip to the row. No hoeing was necessary. The cotton grew to an average height of $6\frac{1}{2}$ feet and the spacing

was entirely too close for the existing conditions. The large growth was the result partly of the peas and the thorough preparation and cultivation and partly from the excessive August rain-fall which was much above normal. These heavy rains also greatly reduced the yield, coming as they did, just as the late cotton was blooming freely. The yield was 492 pounds of lint per acre. The cost of working this cut was reduced about \$1.50 per acre saved in hoeing.

Checking cotton level is not recommended except for exceptionally well drained land. Where an early crop is desired, this method is not advisable. That it saves labor and also stimulates the growth of the plant, because of the more thorough preparation and cultivation of the land, is true. We shall try checking on double beds next year.

Long and Short Staple.—The relative yield of different kinds of cotton, considered according to different lengths of staple, is a subject of general interest to Delta planters. It is a well known fact that this section is especially adapted to the growing of long cotton. It is important to know what may be considered the normal difference in yield of the representative varieties of different lengths. That the relative yield will vary somewhat from different soils and for different seasons is quite probable.

In the test we used eight varieties of well known merit. Two were one inch, two, one and one-eighth, two, one and three-sixteenths, and two, one and seven-sixteenths. The following yield per acre for each staple is the average of the two varieties for the season of 1907. 1 inch, 1825 pounds of seed cotton, 645 pounds of lint:

1 1-8 inch, 1780 pounds of seed cotton, 570 pounds of lint;

1 3-16 inch, 1728 pounds of seed cotton, 510 pounds of lint;

1 7-16 inch, 1500 pounds of seed cotton, 430 pounds of lint.

Varieties.—The following table gives the results of a comparison of fourteen varieties made in 1908.

NAME.	1st Picking.	2d Picking.	Total Seed Cot- ton per Acre.	Total Lint Cotton per Acre.	Staple.
	Lbs.	Lbs.	Lbs.	Lbs.	Inches.
Cleveland Big Boll	1228	275	1503	548	1 1-16
Lewis' Prize	1015	397	1412	517	1
Cook's Improved	987	308	1295	495	7-8
Triumph	987	308	1296	463	1 1-16
Ingram	881	367	1248	420	1 3-16
Black Rattler	805	303	1108	377	1 3-16
Keno	801	571	1372	377	1 3-16
Sunflower	859	333	1192	367	1 7-16
Red Leaf	702	313	1015	368	1 1-8
Strickland	521	557	1078	366	1 1-8
Columbia	787	308	1095	358	1 5-16
Griffin	794	286	1080	355	1 7-16
Wells	719	365	1084	344	1 5-16

FERTILIZERS.

There is an increasing interest in the question of using fertilizers in the Delta. Many planters are taking the view, that because this soil is naturally fertile is no reason why its capacity to grow crops should not be increased, if it can be done so profitably. It is simply a business proposition, and in order to proceed in a business way, the planter wants to know what fertilizers are needed, and how and when to apply.

The land on which the tests were made has been cropped in cotton for many years. A part of it is loam soil and is well drained. A test was also made on stiff buckshot land. While this is fairly well surface-drained, it is inclined to be wet in the spring. The variety of cotton used in the test is a short staple and prolific.

Results.—The average increase from 300 lbs. of high grade cotton-seed meal per acre for the three years has been 106 pounds of lint cotton. We have not been able to increase the size of the crop nor its earliness by the use of either phosphorus or potash. The phosphorus was applied in the form of 14% Acid Phosphate. Both the Muriate of Potash and Kainit were used. These fertilizers were tested each year alone, and in combination with each other and with meal. It must be remembered that our tests were made on old land. That

the result might be different on new land, or old land made rich in nitrogen by the use of peas, is possible.

The increase from the application of 300 pounds of cottonseed meal to the stiff buckshot land was 36 pounds of lint cotton per acre. This is not sufficient to make the use of the meal profitable on this character of land. Nor has peas proved so beneficial to this land as to the loam land. When it is thoroughly drained by tiling the results may be different.

Fertilizers for corn.—300 pounds of cottonseed meal per acre has given an average increase of seven and one-half bushels. When corn is 60c per bushel or higher, the application of meal is profitable.

Method of applying meal.—For cotton, we have had best results when the meal is applied in the drill at planting time. The land should be bedded sometime before planting and the beds firmed by rain. Run the fertilizer distributor on the beds, putting the meal about three inches deep. Follow with the harrow to reduce the height of the beds and plant. There will be no bad effects from the immediate contact of the seed and meal. For corn, it is best to apply the meal on each side of the rows after the corn is from two to three feet high. The meal is best applied with a fertilizer distributor.

Peas as a fertilizer.—A test was made in 1907 and 1908 to determine the value of peas planted in corn as a fertilizer for cotton the following year. The seed were picked and the vines and stalks turned under in the winter. The increase attributable to the peas was 110 pounds of lint cotton per acre.

Undoubtedly, the proper way to maintain the fertility of Delta lands is to adopt a rotation which includes corn and peas and leguminous hay crops. The peas do not interfere with the corn crop. If picked for seed or grazed with hogs, they are a valuable money crop. In addition to supplying nitrogen, the only element of fertility which seems to be needed for our old lands, they add humus which is absolutely essential for a maximum crop on any soil.

DRAINAGE.

Surface drainage.—The farm has been surface drained with broad shallow ditches, made either with a two-horse road machine or drag road scraper. The rows run out into these ditches which quickly carry the water off, while they occupy very little ground, being used as turn rows. They are so constructed that a team can cross them or turn in them at any point. Ditches should never be made with spade and shovel for two very good reasons: First, this method is too expensive; and, second, the dirt must be put in

the wrong place, and, consequently, water cannot get into the drains.

Every large plantation should have both a standard and a small two horse road machine, and small farms should have a two-horse machine; both should be supplied with drag-road scrapers. With these implements and good teams and intelligent supervision, drainage in the Delta is really an easy proposition because there is generally at hand a natural outlet and a sufficient fall. There are some sections that should form drainage districts to secure outlets; this is being done in some localities under the present law, and this question will receive more attention in the near future.

Tile drainage.—About fifty acres of the farm was tiled in December, 1908. While it is too early to report on the effect of this drainage, it is carrying off the surface water satisfactorily and we expect good results from this work.

Tiling, if properly done, may be regarded as a permanent improvement, and its effectual work has passed the experimental stage. Besides carrying off the surface water, tiling aerates and loosens the soil. It makes possible earlier planting. It also conserves moisture in summer. Much interest is being manifested in the subject in the Delta and this interest will rapidly grow as the good effects are seen.

TRUCKING.

No attempt has been made to do general trucking at the Station. We have grown, on a limited area, Irish potatoes, sweet potatoes, turnips, strawberries and sugar cane. These crops have all done well. The yield from Irish potatoes was 172 bushels per acre in 1907. The crop was followed by peas for hay. In 1908 the Irish potato crop was followed by turnips sown in August. The turnips made 250 bushels per acre and sold for 60c per bushel.

Sugar cane for syrup is a promising crop. A mill will be located in our immediate vicinity next year and we will make a test of the yield of syrup.

Judging from our limited experience, and also from the growth of vegetables in the home garden, the loam land of the Delta is undoubtedly excellent for trucking.

HOGS.

In Bulletin No. 107 which is available for distribution from the Mississippi Experiment Station, Agricultural College, Miss., we give a full account of our work with hogs.

We strongly urge the growing of hogs in the Delta and believe that they fit admirably into our rotation and add a valuable money crop, at the same time enabling us to improve the land.

Mississippi Agricultural Experiment Station

BULLETIN NO. 120.

FARMERS' INSTITUTE BULLETIN

1907 and 1908

E. R. LLOYD.



Fig. No. 1.—Convenient Plan for Feeding Sorghum Hay.

AGRICULTURAL COLLEGE, MISS.

DECEMBER, 1908.



FIG. No. 2—Negro Institute in the Delta.

INTRODUCTION.

The growing interest in, and the increased demand for Farmers' Institutes throughout the State influenced the last legislature to increase the appropriation for this work from \$6,000 to \$10,000 for the next biennium. This has increased the efficiency of the Department so that, instead of holding all the institutes during the three summer months, as was formerly the case, the work is now distributed throughout the entire year. Since July, 1908, institutes have been called for and held every month. During the past season institutes have been held in seventy-four of the seventy-eight counties in the State.

In 1906 the total attendance at the regular institutes was 16,423, in 1907 the attendance was 14,109, and in 1908 the attendance was 36,874. The indications are that 1909 will show the largest attendance in the history of the institute work. From December, 1908, to March, 1909, five different railroads have furnished Farmers' Institute trains, without expense to the Department. This has enabled us to cover a greater territory than would have been possible under ordinary conditions. In some sections of the State the negro farmers have taken great interest in the institute work, and a few institutes have been held especially for the negro farmers.

The following table gives a list of the institute meeting, and the attendance at each, in 1906, 1907 and 1908; also the aggregate attendance by counties.

COUNTY AND PLACE.	Number of Institutes held in 1906.	Attendance in 1906.	Number of Institutes held in 1907.	Attendance in 1907.	Number of Institutes held in 1908.	Attendance in 1908.
ADAMS—Natchez.....					2	4750
Washington	1	200				
ALCORN—Kossuth	1	200				
Kossuth			1	130		
New Hope			1	350		
AMITE—Gillsburg	1	30	1	25		
Gloster					1	500
Hominy Creek School					1	100
Mars Hill					1	400
Liberty	1	7				
Mt. Olive Church	1	50	1	40		
Olio			1	100	1	250
Smithdale			1	60		
Thompson			1	100		
ATTALA—Ethel	1	35				
Hesterville			1	400		
Kosciusko	1	100			1	60
McCool			1	55		
Providence Church					1	50
Rainwater School					1	125
Sallis					1	35
Smyrna	1	50				
BENTON—Ashland	1	60	1	40		
Michigan City	1	95	1	100		
BOLIVAR—Cleveland					1	200
Duncan					1	150
Mound Bayou					1	300
Shaw					1	200
Shelby					1	250
CALHOUN—Banner	1	200	1	30		
Big Creek					1	50
Retreat	1	75	1	75		
Sarepta	1	230	1	60		
Slate Springs	1	230	1	200	1	35
Timberville					1	75
CARROLL—Black Hawk	1	30				
Carrollton	1	100	1	9		
Vaiden			1	50		
CHICKASAW—Egypt					1	25
Houlka	1	150			1	12
Okolona					1	35
Woodland	1	200				

COUNTY AND PLACE.	Number of Institutes held in 1906.	Attendance in 1906.	Number of Institutes held in 1907.	Attendance in 1907.	Number of Institutes held in 1908.	Attendance in 1908.
CHOCTAW—Ackerman			1	40		
Chester	1	15				
French Camp	1	800				
CLAIBORNE—Hermanville			1	25	1	200
Port Gibson	1	50	1	20	2	290
CLARKE—Beaver Dam School					1	80
Enterprise	1	400	1	75		
Pine Hill Church	1	150				
Quitman					1	700
Vossburg	1	25	1	40		
CLAY—Brand's Store					1	60
Cedar Bluff	1	55	1	215	1	39
Una					1	15
COAHOMA—Clarksdale			1	500	2	100
Dublin			1	500		
COPIAH—Barlow			1	75	1	135
Caseyville					1	160
Crystal Springs					1	250
Dentville			1	20		
Hazlehurst	1	50	1	25	2	575
Wesson	1	55	1	25	1	200
COVINGTON—Bay Springs					1	75
Collins					2	600
Don't	1	150	1	100		
DESOTO—Eudora	1	200				
Horn Lake	1	150	1	40		
Senatobia	1	10				
Tyro	1	60				
FRANKLIN—Hamburg	1	75				
Kennola			1	75		
Knoxville					1	235
Little Springs					1	180
Meadville	1	50				
GREENADA—Graysport	1	60	1	38	1	36
Holcomb			1	12		
HARRISON—Gulfport	1	20				
Long Beach					1	45
Wiggins					1	60
Wool Market					1	50
HINDS—Clinton	1	45	1	50	1	75
Florence					1	150
Jackson					2	65

COUNTY AND PLACE.	Number of Institutes held in 1906.	Attendance in 1906.	Number of Institutes held in 1907.	Attendance in 1907.	Number of Institutes held in 1908.	Attendance in 1908.
MONTGOMERY—Duckhill			1	30		
Kilmichael	1	50				
Poplar Creek			1	75		
Winona	1	60	1	75		
NESHOMA—Center Hill Church					1	500
House			1	100	1	150
Neshoba	1	30				
Oakgrove					1	50
Philadelphia	1	40				
Sandtown					1	100
NEWTON—Newton	1	40	1	7		
Battlefield			1	250		
Beulah (Hebron Church)			1	250	1	500
County Line			1	50		
Decatur	1	250	1	40		
Hickory					1	50
Union					1	50
NOXUBEE—Mashulaville	1	75				
OKTIBBEHA—A. & M. College	1	300	1	300	1	1000
Maben	1	300	1	30	1	27
Starkville					1	150
Sturgis	1	100	1	15	1	120
PANOLA—Pleasant Grove	1	50	1	8		
PEARL RIVER—McNeill	1	250	1	250		
Poplarville	1	25	1	20		
PERRY—Hattiesburg	1	15				
PIKE—Bluff Springs					1	300
Bogue Chitto Church					1	80
Darbun	1	56				
Friendship Church					1	25
Magnolia					1	200
McComb City					1	100
New Zion					1	200
Pisgah Church					1	150
Osyka					1	65
Salem Church					1	150
Sartinville					1	75
Simmons ville	1	75	1	100		
Tangipahoa					1	500
Topisaw	1	100				
Tylertown	1	70	1	50		

COUNTY AND PLACE.	Number of Institutes held in 1906.	Attendance in 1906.	Number of Institutes held in 1907.	Attendance in 1907.	Number of Institutes held in 1908.	Attendance in 1908.
Union Church					1	150
Walker's Bridge					1	250
PONTOTOC—Algoma					1	40
Pontotoc	1	125				
Randolph			1	400		
Toccopola	1	200				
Troy	1	225	1	20	1	100
PRENTISS—Booneville	1	75	1	15		
RANKIN—Leesburg			1	800		
Plain	1	200				
SCOTT—Harpersville	1	75	1	40	1	200
Homewood	1	150				
Patron's Union	1	300	1	300	1	150
SHARKEY—Rolling Fork					1	225
SIMPSON—Goodwater Church					1	225
Mendenhall					1	400
Weathersby	1	500	1	12		
SMITH—Burns	1	25	1	40		
Lingle					1	225
Raleigh	1	90	1	50		
Sylvarena	1	95	1	50		
Taylorville					1	1000
TALLAHATCHIE—Cascilla	1	350	1	20		
Charleston	1	60				
Tutwiler					1	75
TATE—Arkabutla	1	100	1	50		
Coldwater	1	30	1	30	1	50
Strayhorn	1	100	1	30		
Tyro			1	40	1	50
TIPPAH—Cotton Plant	1	250	1	80	1	110
Ripley	1	150			1	110
TISHOMINGO—Iuka					1	40
New Hope Church					1	250
UNION—Myrtle			1	100		
WARREN—Vicksburg					1	30
WASHINGTON—Greenville					1	200
Hollandale					1	300
Leland					1	200
WAYNE—Waynesboro					1	55
WEBSTER—Bellefontaine	1	150	1	175		
Eupora	1	60	1	14		
Mantee					1	50

COUNTY AND PLACE.	Number of Institutes held in 1906.	Attendance in 1906.	Number of Institutes held in 1907.	Attendance in 1907.	Number of Institutes held in 1908.	Attendance in 1908.
WILKINSON—Ashby School House.....					1	150
Centerville	1	100			1	400
Rossetta	1	150	1	150	1	220
Woodville	1	45			1	200
WINSTON—Betheden	1	150	1	125	1	100
Claytown			1	100		
Louisville	1	50				
Noxapater					1	020
Perkinsville			1	200	1	50
Plattsburg	1	25				
YALOBUSHA—Coffeeville	1	45	1	40	1	15
Oakland	1	60	1	30		
Water Valley			1	42	1	500
YAZOO—Benton	1	12				
Hebron Church	1	350	1	1000		
Sartartia	1	30				
Yazoo City	1	100			1	600

GROWING COTTON UNDER BOLL WEEVIL CONDITIONS AS SUCCESSFULLY PRACTICED BY R. L. BENNETT, COTTON EXPERT, PARIS, TEXAS.

Briefly As To Weevil Conditions.

The number of weevils that live through the winter and appear in the spring from winter hibernating places is comparatively small and vary in different years, more some seasons and less others. A majority of these weevils appear at about the time that cotton, planted at an average date in any locality, north or south, begins to branch and set squares. The weevils then begin to lay eggs in the squares and increase very rapidly in numbers. Obviously cotton must grow and set squares faster than the weevils can increase and destroy the squares. My experience of five years of cotton growing and cotton breeding under weevil conditions, is that the weevils increase in 90 to 100 days from date of planting the cotton, say April 20th, to such numbers as to stop the cotton from further fruiting, by August 1st. When many weevils pass the winter the fruiting period is about 90 days, and when few weevils pass the winter 100 days is the fruiting period of the cotton. Of course the weevils are destroying squares during the fruiting period,

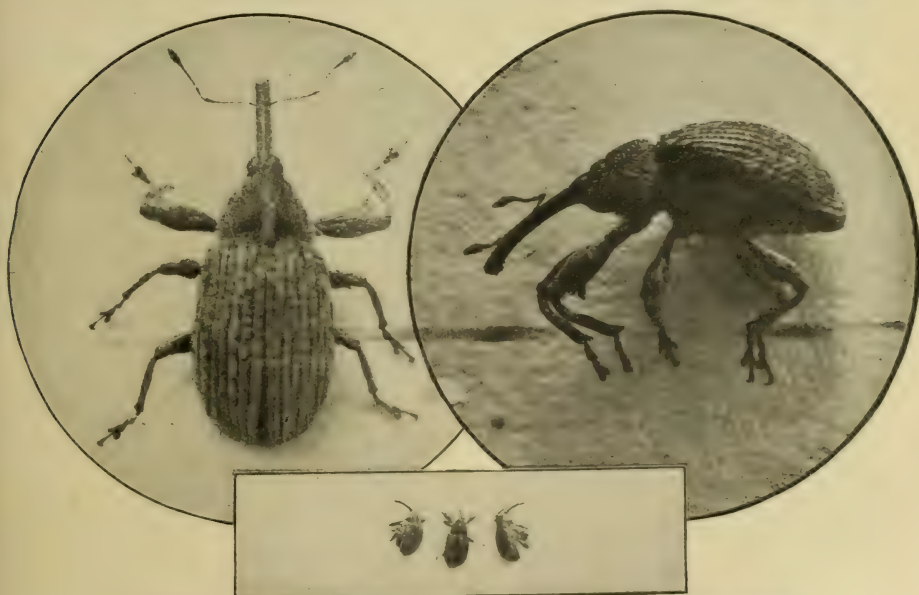


Fig. No. 3—Adult weevils; natural size below, much enlarged above.

but the cotton grower may remember that before weevils came his crop was set into bolls in 90 to 100 days from planting, also that cotton sheds squares more or less from beginning to the ending of the fruiting period, and the greatest shedding is near the close of the period, thus corresponding to the destruction of squares by the weevil. The weevils, therefore, relieve the cotton plant of the usual shedding and under proper cultivation of the cotton, to be described later, the weevil may destroy but little more than the normal shedding. Few bolls of any size are injured by weevils until the squares are finally destroyed. I undertake to make my cotton grow and fruit as rapidly as possible, so fast that the destruction of squares will hardly exceed the normal shedding. Under proper methods of growing cotton shedding is less than under improper methods.

The early spring appearance of the weevil necessitates every farmer planting not later than a normal date, that is a date favorable as to warmth and settled weather, for prompt germination and growth of the cotton. Some may plant earlier but their cotton will not grow off till the weather is warm and it is liable to become "grassy." No farmer should plant later than the normal and every farmer should plant at a date that is safe or normal to the late spring years, and should record that date and plant at that time every year, whether he has weevils or not. The date I begin planting in North Texas, is April 20th to 25th, regardless of an early spring, or the date when my neighbors may begin or finish. Later planting than a normal date lessens the 90 or 100 days of fruiting above described.

With this brief statement of the conditions imposed by the weevils, I will briefly describe my method of growing cotton, and by its practice I am certain of a large yield per acre. The principles which I observe and which are here described are applicable to all sections where ainfall is abundant.

First Principle.—Plant no more cotton than a single mule can cultivate, that is to say that can be gone over in four days, working 3 or 4 acres per day, or 12 to 16 acres per mule, depending on the liveliness of mule and driver, the character of the soil, etc. This four days allows three days per week for rain to fall and dry off. Two horse or mule cultivators on wheels, walking preferred, can go faster and go over more land in the same time. Therefore, if these are used the acreage per mule can be slightly increased.

Second Principle.—Feeding or Fertilizing the Cotton.—Rapid growth and large fruiting in 90 or 100 days on most uplands is depend-

ent on fertilizing. On my land, loam upland, where without fertilizing a half bale under proper treatment is certain, I use 200 to 250 pounds mixture of phosphoric acid and nitrogen, about two parts acid phosphate to one part cotton meal, or other substance, to furnish the nitrogen. No potash is used and only few soils need it, perhaps only some sandy soils need it for cotton growing. Cotton on some soils is not profitably benefitted by the use of either nitrogen or acid phosphate but is benefitted by cowpeas or soy beans, the former is planted between rows of corn and the latter between rows of cotton. Although on thin soils cowpeas are planted between the cotton rows and on such soils the cowpea, a variety like the Whippoorwill, does not run enough to interfere with the cotton. Wide rows are required when the legumes are grown between the cotton, about five feet. The Mississippi Experiment Station authorities say that the Delta soils are greatly benefitted by legumes.

Many soils require more fertilizing than my soil requires in order to make a bale, but usually such soils need legumes first, then fertilizer, or both, at the same time in the manner described above. I plant the fertilizer in the bed about 4 inches deep with my cotton planters before I plant the cotton seed. It could be put down before bedding when bedding is done late, but late listing or bedding is not advised.

I will state emphatically that if cotton is properly grown all soils rich or poor will yield more cotton than they do regardless of weevils and regardless of fertilizers, but good feeding increases yields and profits.

Third Principle.—Plant cotton on a bed for drainage and warmth—not too high, just good water furrow between. Lands that are wet until late spring must be drained or planted in other crops than cotton under boll weevil conditions. I form beds or “list” three and one-half feet apart on upland in the fall or early winter, with one horse to a 6 or 7 inch steel beam turn plow. Later I run out middles, which are either old cotton or corn rows, with a long pointed 16 inch sweep, which has welded to its point, a “duck bill” $2\frac{1}{2}$ inches wide and 4 inches long, which cuts the tap roots of cotton and the stubble, falls back in the middle, not on the bed to interfere with seed planters. I use a curved steel beam stock and two horses to run this sweep, and I do this about ten days before planting time. The stalks, whether corn or cotton are cut with two horse revolving stalk cutter, as first operation. I rarely run a center furrow to bed on, as the old middles are soft. The cotton stalks are cut off as soon as picking is finished, whether the stalks are green or dead. On some soils the list or beds might be formed with proper plows on two horse cultivators. I cut

off the tops of the beds with a large solid sweep, at planting time, which, with running out middle as described, destroys all vegetation before planting and gives a firm bed; but no hard "core" or "hard pan" under the bed. Foul corn or other land covered with dead grass cannot be put into proper beds. Flat breaking is necessary, then beds may be formed by running a wide sweep for water furrows or drainage, and the seed planted on the bed between these furrows, I consider rebidding a useless expense, and if it is done late, just before planting it is harmful. Bed properly at first and let that be final.

Fourth Principle.—A firm bed, one that has been thrown up and firmed by rains, or if no rain then by a heavy roller. I bed up four to six inches deep on uplands, but such depth of breaking is not advisable on sandy or fertile bottom land; shallow breaking is better. Such soils are naturally loose enough for root growth and left as they are they hold less water and the plants grow less rank and are earlier. Almost every soil is penetrable by cotton roots when kept moist by stirring the top soil after each rain during the growing season.

A firm bed prevents the planter, if it be a one-horse planter, from going too deep, and allows shallow planting. Shallow planting, about one-half inch and less depth if soil "crusts" does not hold surplus rainwater around the seed, and the seed get warm quicker from the limited heat of the early spring sun than deep covered seed. Also, young plants are not exhausted of the food in their two seed leaves in coming through the thin covering, and therefore, are stronger and resist disease and grow off faster. Shallow planting is essential for early planting, and early planting is necessary under weevil conditions. If I could plant late I would cover depely. A perfect stand is of first importance.

Shallow planting permits planting fewer seed per acre. I plant one-third bushel of seed to the acre. More seed is necessary, one-half bushel to acre, if not planted exactly right. My seed are ginned clean so they will separate in planting and come in closer contact with the soil.

Fifth Principle.—Rolling or Pressing the Soil on the Seed.—I use a planter with a roller attached to and behind, as part of the planter. This prevents a one-horse planter from going too deep, and it firms the seed in contact with the soil beneath them and moisture freely enters and germination is prompt. A two-horse roller may be used. I consider a scooter to open and scooters to cover objectionable on a well prepared firm clean seed bed. They may be necessary on trashy

seed beds, and late planting, but I am careful to avoid such beds and late planting. A clean seed bed is obviously of great importance.

Sixth Principle.—Early and Rapid Fruiting Cotton.—The seed is the beginning of the crop and the quality of the seed foretells the yield. Pure highly bred seed, possessing desirable qualities, is of the utmost importance. In five years of cotton breeding for early and rapid fruiting to escape boll weevil I found great difference in cotton in respect to these qualities. Early opening is not as important in escaping weevils as is early and rapid setting of squares and bolls. Hence the plant must begin to fruit near the ground for early fruiting and have short joints for rapid fruiting. I pointed out the fact that these two characters, low fruit limbs and short joints, distinguish early and rapid fruiting cotton and that they are a guide in seed selection.

Good length of staple can go with the above qualities and characters. My work in breeding long staple cotton has resulted in as early fruiting, and rapid fruiting, and opening of the bolls as the best short staple cottons.

The cotton grower should remember that pure seed of a cotton are all of one color, size and general shape, especially the color must be uniform. Likewise the plants must be uniform in all characters. An occasional plant may be found that is different from the type, but that is a natural variation.

Seventh Principle.—Chopping, Early and Shallow Cultivation.—I cultivate once or twice with small sweeps before chopping and chop only after cotton has five or more leaves, and to one plant in a hill, eighteen inches apart; but remember, I plant only a few seed, one-third bushel per acre, and my plants do not need early thinning, and so my chopping is also a half-hoeing. Whatever late hoeing may be required is a small matter. On uplands where less than three-fourths bale per acre is expected, the plants should be not over 12 inches apart and three feet rows may be used.

I do not pick up and destroy the first weevil injured squares that fall, but where labor of small boys is cheap the first squares to fall could be profitably picked up and destroyed. Destroying squares that fall later is not profitable. The first squares that fall almost invariably contain young weevils.

After chopping I cultivate with wide solid sweeps, in next cultivation use 14 or 16 inch solid sweep. After that I use heel scrapes

of 18 to 24 inches, finally use 30-inch heel scrapes, run once to the middle.

I cultivate not exceeding two inches deep and as often as rain settles the soil. No oftener. This prevents vegetation and prevents evaporation of water or drying of under-soil. I continue cultivation to about two weeks before cotton begins to open, and I hope to have a bale or more to the acre.

Remarks

Plenty of corn, hay and hogs, molasses, vegetables, and cowpeas, for the farm is imperative; and the corn and hay should be grown on the moist soils, if any on the farm.

Labor can be easily taught the principles of cotton growing and of growing food supplies, and the right handling of efficient tools.

During the past five years of cotton investigation under boll weevil conditions, and of cotton breeding for early and rapid fruiting to escape boll weevils, I worked out and tested the above seven principles and I am now following them successfully in private cotton growing. If these principles are observed by others, thoroughly and efficiently, with strict regard to details, the result will be highly profitable.

The long staple cottons and Benders now grown in Mississippi, are later in opening than some of the earlier opening short staples, but as the weevil attacks but very few bolls of any size, and only the very young bolls, until after consuming the squares as fast as they are set at the latter part of the season, I recommend that Mississippi long staple cotton growers do not abandon their present varieties until it be definitely proven, after the weevil arrives in full force, that such cottons cannot be profitably grown. These long staple cottons may be as profitable to grow under the method above described as the earlier opening short staple cotton, and they should not be discontinued too quickly. Texas made such a change and regretted it. The Texas cotton growers in a boll weevil panic five years ago abandoned their varieties and imported thousands of car loads of short staple cottonseed, but after testing these short staple cottons and after receiving the information about early cotton, from the breeding investigation in my charge, the growing of these short staple importations was discontinued. It is true that Texas does not grow the staple that West Mississippi does, but the principle is the same as between lengths of staple.

The first thing for Mississippi long staple cotton growers to do under boll weevil conditions, is to change methods of growing cotton ac-

ording to the principles above recommended. Making the change in order to produce a large crop of bolls in a short time, 90 to 100 days, in the first part of the growing season. After this has been done the present long staple varieties of cotton may be changed to any new kinds of long staple that may be earlier than those now grown—earlier in setting fruit and in opening.

From the facts and experience briefly stated I would strongly recommend that the long staple cottons be continued and not suddenly discontinued for the short staples. A small reduction of the yield of good staple cotton by the weevil would raise the price of the quantity produced to a profit equalling or exceeding, probably that of a full crop in anti-weevil times.

REGARDING LATE PLANTING TO AVOID DAMAGE BY THE BOLL WEEVIL.

W. D. HUNTER, Bureau of Entomology U. S. Depart. of Agriculture.

It seems to be the impression of the gentlemen who have recently been advocating late planting as the proper means of avoiding damage by the weevil, that their theory is new. As a matter of fact, however, the idea has been broached by many people at different times. The original advocate of the late planting theory was Mr. W. W. Wentworth who was living in Goliad, Texas, in 1895. In that year he brought the matter to the attention of the Department and wrote extensively about his theory in the press. Some years later he called a convention of cotton growers at San Antonio, where he expounded his theory at great length. Since Mr. Wentworth's theory was first propounded, almost fourteen years have elapsed. During that time a number of persons, in regions in which the weevil has only recently made its way, have announced the same theory. It is very natural for any person to make the mistake of supposing that the weevil can be thwarted in that way. From a theoretical standpoint it seems easy. It is noticeable, however, that these advocates of late planting, as far as the writer knows, have not been practical planters. For the most part they have been either cotton buyers, cotton oil mill men, or others in business directly connected with the production of cotton but not cotton planters themselves, and consequently without means of trying their theories in a practical way. Certainly during the fourteen years of the agitation in a public way of this idea it would have taken hold somewhere. The fact is that the unanimous testimony of cotton planters in Texas who

have been forced to contend against the weevil, is that their best success has come from early planting.

Undoubtedly, long after the present advocates of late planting in Louisiana shall have been convinced, as the people of Texas have, others in new regions will arise who have conceived the same idea. The writer does not decry the open discussion of an important question like this, but believes that the advocates of late planting should back up their position with practical results and not with records from exceptional cases of forced and carefully nursed cotton before they obscure the general great importance of having the cotton crop planted early in weevil regions.

The Department of Agriculture has investigated the whole subject of late planting and has found that the theory does not work out in practice. The Department has planted cotton late purposely on different occasions to test this matter. The results have indicated to the agents of the Department, to the farmers on whose places the work has been done, and to others cognizant of the facts, that late planting in boll weevil regions is in the vast majority of instances certain to result in loss. In 1906 the Department had four late planting experiments in Texas which will be described briefly.

At Mountain Home, near Kerrville, 16 acres were planted on June 10th on land that was in cotton during the preceding season. There was no other cotton within nine miles of this tract. In November, 1905 the previous crop was practically eaten up by goats so that no green cotton was to be found during that month or during the months following. This late planted cotton grew well, but yielded practically nothing. One of the advocates of late planting in Louisiana has criticised the only published reference to this experiment in one of the Year-books of the Department by stating that the records concerning rainfall are not given. He concluded from general records showing rainfall in Texas, Louisiana, and Mississippi, published by the Weather Bureau, that the rainfall in the Kerrville region was above the normal during the month of July, and that this would have been sufficient to cut down the crop. If this gentleman had looked into the records published by the Weather Bureau in the Annual Report for the Texas Section for 1906, he would have found that the July precipitation at Kerrville was more than one inch below the normal. For August the rainfall was above the normal; but the total for the whole growing season was nearly an inch below the normal. As a matter of fact, as regards rainfall, the season was not at all exceptional. It is very easy for any experienced person to tell whether growing cotton has been

injured by a superabundance of rain or by the boll weevil. Where there has been too much rainfall the plants are sappy with long joints and little fruit. The plants on the experimental tract were perfectly normal in general appearance. They were fruiting heavily, but the weevils were so numerous that they caused the squares to fall to the ground practically as soon as they were put on.

In Robertson County, Texas, during the same season, an isolated field of 2 1-3 acres was planted on June 8th. This field was within the corporate limits of the town of Calvert on the property of Mr. Seth Burnitt. There was no other cotton within three-fourths of a mile in any direction. Half of this plot was fertilized with potash compound and the whole was planted with native seed. As far as weed was concerned the growth of plants was entirely satisfactory but the weevils made their appearance early and caused such a loss of fruit that the planter considered it not worth while to have it picked. Rainfall records for 1906 at Calvert are not complete. Those from Waco, a short distance away, have been used to show the rainfall in the Calvert region. In this case there was an excess of nearly 2 inches for the month of June and nearly 3 inches for the month of July. For the growing season the excess was about 10 inches.

At Llano, in 1906, on the farm of H. K. Willborn, 6 acres of cotton was planted on June 11th, as in the other cases on land that had been in cotton during the preceding season. The Rowden variety was planted and half of the field fertilized with potash compound at the rate of 200 pounds per acre. In this case the nearest cotton was about one-half mile away. This field was practically a complete failure since it produced only 150 pounds of seed cotton per acre. The rainfall for July was .2 inch above the normal and for August 1 inch below the normal. The total for the whole season was 1.4 inch below the normal.

A fourth experiment in 1906 was performed in Mineola on the property of Mr. N. S. Sodekson. In this case 10 acres of Rowden cotton were planted on June 12th. The land was fertilized with potash compound at the rate of 400 pounds per acre. The field was isolated from other cotton by a distance of 1 1-2 mile. The weevils were found in the field before the cotton began to square and damaged it to such an extent that the yield was estimated at less than 100 pounds of seed cotton per acre. The owner calculated that the cost of gathering the scattering bolls would have been greater than the market price so that it was not picked at all. The rainfall records from Longview are used to show the conditions at Mineola in the absence of official records from the latter place. The rainfall for July was 2.4 inches

and for August 3.2 inches above the normal. The total precipitation for the growing season was six hundredths of an inch above the normal.

It will be noted that in two cases the rainfall was below the normal and in two cases above (one of these only .06 inch above). In all cases the late planted cotton was a practically complete failure. It is, therefore, evident that the rainfall could not have been an important factor.

The four localities chosen represent western, central, and eastern conditions in the state of Texas. The results show that notwithstanding the great diversity in conditions between these places the same unfortunate results followed from late planting.

In addition to this practical work conducted in such a way as to make the results clear, the Bureau of Entomology has investigated numerous reported cases of successful late planting in different seasons. In none of these cases have the facts been found to disprove the general advisability of early planting. At Alexandria, La., for instance, in 1908, there were several fields planted late which were supposed to prove the advisability of late planting. One of the writer's agents made several trips to Alexandria through the season to study this matter. It was found that some late planted fields were yielding more than some early planted fields. In every instance, however, it was possible to find early planted fields that were yielding as much or more than the most productive late planted ones. In one case a small tract of cotton planted after potatoes that had been fertilized was found to be producing much more than the other cotton planted earlier in the immediate vicinity. It was found that exceptional circumstances surrounding this field clearly indicated that it was by no means late planting alone that accounted for the result. In addition to the fertilization given the potatoes and the fine condition of the soil the cropper believed (but was not certain) that the land had been an old cattle lot before he came on the place three years before. Moreover, it was found that rain began to fall on the late planted field before the last rows were put in. This served to start the seed immediately and give it such rapid growth as could not be expected under the less artificial and less naturally favored conditions that necessarily surround the great majority of cotton fields.

One of the best statements ever written about the boll weevil was in the report of Mr. H. C. Stringfellow, of Shreveport, La., as the result of a trip he took through Texas in 1908 at the instance of a number of planters in the Ouachita Valley. Mr. Stringfellow interviewed scores of farmers, taking special pains to talk with the men who actually

produced the cotton, that is, the ones that worked the plows and the hoes. It is violating no confidence to state that Mr. Stringfellow found that all successful farmers emphasize strongly the importance of early planting. When the subject of late planting came up last fall, Mr. Stringfellow exclaimed, "We must fight that idea; it will ruin Louisiana if it goes far."

Such are the practical work and observations upon which the Bureau of Entomology bases its conclusion that late planting is of no avail. In addition, it is very easy to show from what is known about the life history and habits of the boll weevil what are the reasons.

It has been proved beyond any doubt whatever that weevils begin to emerge from hibernation as early as March and that the last ones to appear do not come out until about the first of July. This is the result of careful observations in large cages during several seasons, and also upon isolated small fields where the early appearing weevils have been removed day by day. Everything depends upon the amount of protection under which the hibernating weevils are found. If they are lightly covered they become sufficiently warmed early in the season to emerge. If they are in the deep woods or under logs or in cracks in the earth, they are not made active by the sun until much later. It is not natural for all boll weevils to emerge at one time but perfectly natural that they should not do so. What is "natural", therefore, agrees absolutely with what has been found from observations to be actually the case. It is preposterous to say that the late appearing weevils were only individuals that had appeared early and retired under rubbish in the experimental cages. The daily observations and removal of specimens precluded the possibility of more than a very small percentage of weevils at the most being missed after the emergence.

Now, these emerging weevils have considerable hardihood. They can live for some time without food. In experiments performed with hibernated weevils in the spring of 1907, at Calvert, Dallas and Victoria, Texas, it was found that without any food whatever these insects can live a surprising time. About 2,000 weevils emerging day after day were placed in separate glass cages where they were given small quantities of water, but no food. Daily observations were made to determine how many days passed before the death of these weevils. It was found that some weevils emerging in March lived for 51 days; some emerging in April, 46 days; some of May emergence, 33 days; and of June emergence, 12 days. The average life of all weevils emerging in May, without food, was over 15 days. The average longevity of those emerging in June was over 7 days. These records show that any weevil

emerging as late as May 31st could be expected to live without food until the 15th of June. If such weevils obtained a little food, such as they could from volunteer cotton, life would be prolonged far beyond that time. It is important to observe that the season of 1907 was very exceptional. The spring opened abnormally early, so that the emergence from hibernation was far ahead of the normal. In an ordinary season, as shown by the work of other years, the duration of life without food of the May weevils would have been much longer. The weevils emerging in June throw more light on the subject. As has been stated, the average longevity of all specimens emerging in that month was over 7 days, so that a weevil emerging on the 15th of June, as some did even during that remarkable season, could be expected to live until June 22nd, and others emerging on June 25th, as some did, could be expected to live without food to beyond the first of July. As was pointed out the emerging weevils were placed in small glass cages in which they could be observed constantly. Such were unnatural conditions. Unconfined individuals would, undoubtedly, have lived even longer than those referred to.



FIG. No. 4—*a*, newly hatched larva, or grub in young square; *b*, nearly full grown larva in situ; *c*, pupa in young boll picked from the ground. [Aiter Howard.]

In addition to the hibernated weevils that were placed in cages without food, a large series was caged in the same way but provided with food in the form of cotton leaves and squares. There are always some volunteer plants from accidentally scattered seeds that weevils can find early in the season. Therefore the determined longevity of these fed weevils also has a bearing on late planting. The average length of life of the fed weevils that emerged in June was 37 days, of those emerging in May 55 days. Therefore, if there is any volunteer cotton growing (and such growth can hardly be prevented) many hibernated weevils will live over until after the first of August.

From these facts, it must be evident that the weevil could not be "starved out" by any practical late planting. The point may be made that it is not so much starving out that is desired as reducing the number to the extent that a crop may be produced in spite of the insects. The answer to this is the practical experience referred to above, which shows that a profitable crop cannot be made under these conditions.

The early planted crop has the advantage of being far enough along by the first of July to be fruiting with great rapidity. Up to that time the weevils develop much more slowly than in July and August. Therefore, as Mr. Wilmon Newell has pointed out, the early planted crop putting on much fruit by the first of July, has a much better chance to make cotton than a late planted crop, the fruiting period of which will be thrown coincidently with the period of the most rapid development of the weevil. Moreover, though exceptional late fields may yield well the damage by the boll worm and climatic conditions will always prevent any general success from very late planting regardless of the weevil.

Other features of life of the weevil and much additional experimental data which is open to inspection by anyone, all add strength to the recommendation of early rather than late planting that is made by the Bureau of Entomology. This brief statement covers the case necessarily in a general way. The writer will be glad to give further particulars on any specific points to interested persons.

In this connection the attention is directed to the fact that there is much disagreement in the interpretation of the Bureau's recommendation for early planting. Some persons seem to suppose that the term early planting means winter planting or very early planting. As a matter of fact, by early planting we do not mean putting the seed into the ground while there is any great danger of frost. It is better to run some risk rather than have the crop delayed. No two seasons

are exactly alike but the recommendation of the Bureau for early planting should be construed generally as what is known as moderately early planting with an inclination to take a little risk for the purpose of advancing the crop ahead of the weevil.

It may be asked what is the reason for all this talk about late planting and why reputable persons should advocate it in view of the experience of farmers throughout Texas. The advocates of late planting are not necessarily dishonest. In fact, the writer does not believe that any of them are dishonest. They are merely mistaken in their conclusions. It is admitted that instances may arise occasionally where late planted cotton yields better than early. Take the case of pampered cotton planted after potatoes or growing in a highly fertilized lot in town where everything is done to further the greatest possible production of fruit. Under such favored conditions it is possible that late planting may exceptionally show large yields. Such was the case in one of the fields that attracted attention near Alexandria in 1908. To cite such exceptional instances, however, in the face of the experience of the Texas farmers as reported by such men as Mr. H. C. Stringfellow and in the face of the practical work of the Department of Agriculture and the State Crop Pest Commission of Louisiana, is, to say the least, most unfortunate.

SOME PROBLEMS IN GROWING ALFALFA.

B. H. STRONG.

The problems in growing alfalfa successfully in Mississippi are few and easily solved. I can say this from my own experience. You cannot fail to make a success in growing alfalfa, if you sow the seed on black prairies or the bottoms made from these lands. If the land is in cotton and well cultivated, simply level the rows with a good disc harrow, and sow thirty pounds of seed per acre in early spring. If the land is in corn, break it good and deep in the spring just before seeding and sow thirty pounds of seed. If the land is in Johnson grass, break it good and deep in September, cut it thoroughly with a disc, and harrow until you have a perfect seed bed. Sow this fall ploughing as soon as you have a season, and roll with a heavy roller. This will give you good results the following summer. If your land is in Bermuda, sow the seed in the Bermuda sod without breaking the land at all; that is, if the ground is level enough to run hay machinery over it. Sow this land as soon as the frost has killed the Bermuda. I would advise forty pounds of seed on Bermuda sod. If the land is

MISSISSIPPI EXPERIMENT STATION.

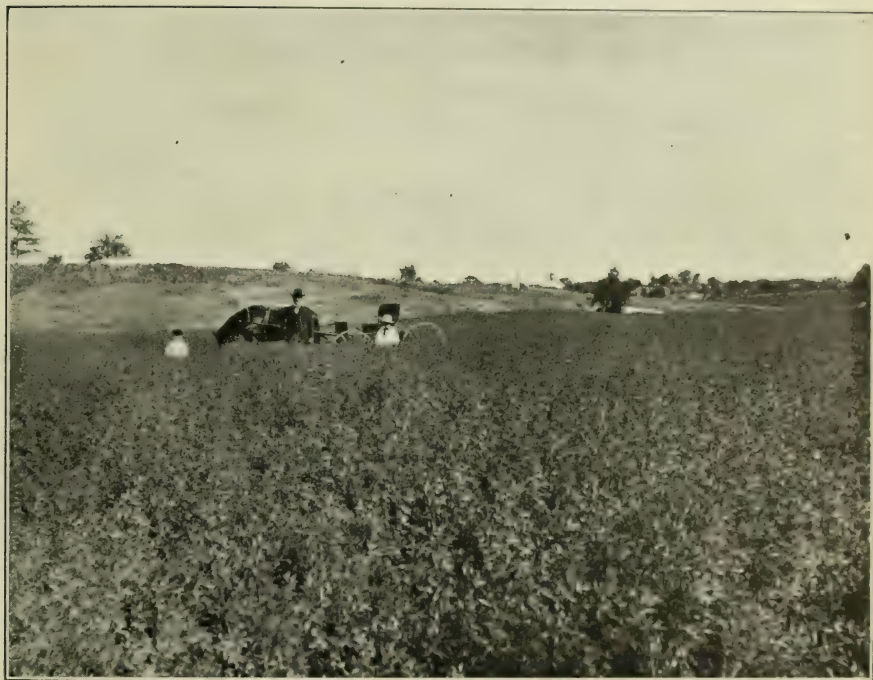


FIG. 5—Alfalfa in Oktibbeha County, Miss.

adapted to alfalfa, you can say good-bye to your Bermuda, for it will be only a short time before the alfalfa has choked it out. If you sow the alfalfa on Bermuda in the spring, it will not do so well, as it will have to contend with the growing grass. If the seeding is done in the fall after the frost has killed the grass, then the Bermuda is in a dormant condition, and the alfalfa will have a fair start. The first rains will germinate the seed, and will grow all winter. The Bermuda sod protects the young plants and holds them in the ground during the freezes, and when spring has come, the Bermuda will be left in the shade.

Now, gentlemen, that is the way I am growing it successfully. My alfalfa fields based on a rental value are paying me ten per cent. on \$100.00 per acre, or paying eight per cent. on \$250.00 per acre, and the tenant is getting rich. Should I go to any of you gentlemen as a representative of a foreign state and say to you that you could go away from home, invest your money in thirty-five dollar land, invest seven dollars per acre more in improvements, and that you had confidence in what I say, how long would it take you to move?

These are the conditions right at your door, and should be taken advantage of. I am buying lands as fast as I can get the other fellow to look my way and lend me the money.

The greatest result we have now obtained by growing alfalfa, and it should be pleasing to every man here who calls himself a citizen of Mississippi, is that Henry B. Gurler, the famous man of Illinois, the man who has made all Europe wonder at his accomplishments has come among us, has invested his money here, and intends to show us what can be done with Mississippi soil. Alfalfa is our phoenix; Mr. Gurler is its crowning plume.

THE VETCHES.

(*Vicia Sativa* and *Vicia Villosa*.)

JAS. T. GARDINER, AUGUSTA, GA.

The number of questions asked me, and inquiries made in the agricultural journals recently about the vetches, show a lively and commendable interest among the farmers of the South, in these valuable forage plants. As there never has been to my knowledge any article on this subject of a satisfactory nature, I will give in part my experience as a grower and dealer in this hay. If this will be of any benefit to even a few, I will not regret the time taken to write it.

The Moore farm (Augusta, Ga.), of which I am manager, was the pioneer in introducing vetch 25 years or more ago, and ever since then has continued to grow them, making a specialty of vetch hay, buying every year thousands of bales. This industry with a modest beginning of a few acres, has grown now to several thousand acres on the grass farms around Augusta, both in Georgia and South Carolina. Our farmers are now recognizing the great improvement in the soil after a few crops of vetch, to say nothing of the profit over other grasses in the crop when made into first class hay, since the price paid for vetch hay is from \$2.00 to \$4.00 per ton more than the Johnson grass, and other native hays.

There are 42 known and classified varieties of vetch, but for our purpose only three need be considered, namely: *Vicia Angustifolia*—locally called our Augusta native vetch; *Vicia Sativa*—sometimes known as English, and sometimes as winter vetch; and *Vicia Villosa*, known as hairy or sand vetch. It is impossible, however, to obtain by purchase commercially the seed of the *angustifolia*, and as a vetch it is fast losing out in competition with the heavier yielding (by two or three times) and more profitable *sativa*; we, therefore, need not consider it.

Vicia sativa is imported (as is also *vicia villosa*) by the United States seed trade from Russia, from which country we obtain our best seed. The states of Oregon and Washington, in the United States, are extensive growers of *sativa* for both hay and seed purposes, but the high trans-continental freight rates keep this north-western seed wholly out of the southern and eastern market.

This northwestern-state vetch, too, is largely mixed with wheat, which cannot be separated from the vetch by the fan mills. The hay produced from the vetches in these two northwestern states ranks high as a forage for all animals. While most of our legumes are summer legumes, vetches, on the contrary, are winter legumes. This gives them special value. Vetch legumes adding nitrogen to the soil in proportion to the crop grown and as per congenial location, add immensely to its permanent fertility, and being harvested easily enough in the spring to follow with cow peas, two crops thus of legumes can be grown on the same land in twelve months. The vetch and peas, I know, will be of more benefit to one soil than is a crop of clover grown on the ground for the same length of time in the North. In fact, if all conditions are favorable, the tonnage of hay from the vetch and pea vine crops will greatly exceed the clover; besides the feeding value is greater—indeed the net amount in dollars and cents will total more by half to two-thirds than the two clover crops. It is a common saying with us that if you make your land rich enough for a maximum crop of vetch, the vetch will keep it permanently rich enough for everything else.

The soil best suited to its growth is one well drained. A loamy one, is, of course, best though. Soil with some clay is preferred to an excess of sand. Sandy soils have produced vetch well. Land that will make the best pea crops will also make the vetch, though the first crop with one inoculation will not be nearly so much as the second crop. As a fertilizer we use 300 pounds per acre of 10 by 4 phosphate and potash as a top dresser in March.

On the Moore farm we plant 45 pounds of *vicia sativa* with two quarts of re-cleaned oats per acre—the latter to help hold the former up; putting both in with disc grain drill after going over the land two ways with disc harrow—and more if on hard sod fields, getting in the seeds about one inch deep. For the *vicia villosa* we use 25 pounds of seed per acre and two quarts of oats. After the seeding is all over, a careful man on horseback sows two quarts of late crimson clover (put cotton in the horse's ears to keep seeds out). If the seasons are favorable this crop in April and early May will be the most beautiful one ever seen, with its wealth of purple, pink and crimson blooms, and its many shades

of green. It is truly a delight to the eye, standing from three to four feet high—many of the stalks of the villosa I have found by measure to be nine feet long. The average of our fields is one ton per acre, though many will make twice that amount. The hay of the vicia sativa as a rule is preferred to villosa, for the reason that it does not grow in such tangled masses, and is, therefore, easier, for this reason to cure. The average farmer, therefore, from sativa will make a better grade of hay. The sativa seed, too, is about half as costly. Some growers here plant 75 or 100 bushels sativa and no villosa. I would advise, however, planting both varieties, if grown for hay, as the villosa ripens two weeks later than sativa, giving time to save one crop before the other is ripe. Both the vetches tiller or stool, the villosa running from 5 to 12 per seed and the vicia perhaps from 3 or 4 to 6.

Our Augusta vetch fields are, however, by no means all planted with oat and clover mixture, the majority of the growers, in fact, sowing alone in about the same quantities as above, depending on the native grasses, such as Canary, Johnson, and Bermuda to fill, up all the vacant spaces.

The villosa I regard as slightly hardier, withstanding cold perhaps year in and year out in all latitudes, somewhat better than the sativa. It is a much slower growth to start with, but, after the warm days of March, it makes rapid strides and soon overtakes the more steady and progressive sativa.

The time of planting in this latitude is from September to December for the sativa—villosa seeding may continue two weeks longer. We try, however, to finish our planting by November 1st.

Great care should be used in buying seed in these days of universal adulteration. Old seed that have lost their power of germination can be bought for a song and when washed and cleaned and mixed with the fresh seed, none but the foxy manipulator could tell it by looking at them. Buy of some one who is alert, and on to these tricks of the trade, who is reliable morally and financially, and you will get the best that can be had.

As a soiling of freshly green cut crop, both the sativa and villosa are used about Augusta by the dairy men. My observation is that as regards dairy cows, nothing changes milk and butter on farms in this vicinity more quickly both as regards to quality and quantity of milk, than the combination crops as used here by our dairy men; from a poor flow of washed out watery milk, the vetch will give it a rich yellow cream and solid good good tasting milk. For sows with spring pigs it is equally good; you can see the little fellows actually grow.



FIG. 6—Hairy vetch in full bloom.

Some dairy men plant per acre 1 bushel of beardless barley, and 1-2 bushel of one of the vetches, and 1 bushel of rye; some decrease these amounts. If planted quite early in the fall, the beardless barley part of the crop can be cut within 60 or 80 days from planting. Then in early spring the rye and vetch are cut together and this cutting can be followed by two or three similar cuttings later in the season.

If this combination, however, is sown late in the winter the three forage crops can be cut all at the same time. Vetches, too, will do well sown either with beardless barley alone or with rye. The vetches and especially the *villosa* furnish a wealth of blooms in the spring. During the vetch season bees will deposit about Augusta two or three times the amount of honey that they will at other seasons. The honey is white, and of especially good flavor.

As to vetch hays' feeding value, we all know the value of wheat bran as a feed; now the analysis of vetch is practically the same, as it is very rich in protein.

Referring to an earlier part of this letter, let me add that late crimson clover should always be sown on hard ground; unlike any

other plant of my acquaintance, it prefers to make its own bed, and likes that bed hard.

In the northwest sativa is pastured in large amounts by cattle from midwinter till spring; and then it is allowed to grow out for hay cutting. It is also cut green when a foot high, and, therefore, successively cut till ripening time.

Sativa and villosa do not reseed themselves here when cut for hay—the pods not being sufficiently ripe to shatter the seeds to the ground in the hay cutting. Seeds, however, when ripening on the plants and falling to the ground will reseed the ground for another year. In all of Augusta territory there is now growing wild, and increasing in amount each year (by re-seeding) just as in Japanese clover, some half dozen or more varieties of vetch.

The greatest mistake that the Southern farmer makes in his management of the soil is, when he allows his soil to remain bare of crops throughout the winter, and lets the rain wash through the soil, and rob it of fertility, that under the general condition of relying on commercial elements to restore, makes it bad yea, very bad, business, unprofitable in the extreme; when by using a winter crop of small grain with the vetch mixed with it, he would not only save the fertility already there, but with the vetch he could so increase the fertility, as far as nitrogen is concerned, that he could grow bumper crops without buying an ounce from the fertilizer company, and at the same time be adding the much needed humus to the soil.

I think that the vetch plant is destined to become the savior of our long mismanaged soils, and that, ultimately, it will make the soils of our Sunny Southland become as fertile and productive as any on earth.

According to experiment reports the nitrogen left and stored in the soil for future crops is greater even from the vetches than from the cow peas.

A good series of crops (2 of them being legumes, and all within the 12 months) is to plant early in September vetch and beardless barley together, graze or cut the barley in the winter, cut the vetch, say in April, and then plant down cow peas for summer hay cutting. The added value to any soil of these two legumes with or without the barley, should be in the one year, \$6.00 or \$8.00 per acre.

I feel that it would be in a measure ungrateful in me not to publicly thank Mr. N. L. Willet, of the N. L. Willet Seed Co., (vetch importers) of this city, for their able and successful efforts in forcing in the spring of 1905, the United States Treasury Department to recognize

their mistake, and thus reverse all their former decisions as to the classification of vetches, thus allowing them to come in now, duty free. This is a saving of 30 per cent. (75c to \$1.20 a bushel) to all the growers of this country and which places the vetch seed on a reasonable basis of price and within the reach of everybody.

PRODUCTION OF CHEAP PORK IN THE DELTA.

BY J. W. FOX.

The biggest problem of the Mississippi farmer is how to get rich land. The real issue is not the boll weevil, nor the deep versus shallow plowing, nor varieties, nor the tariff, but it is rich versus poor land. A poor farmer can make fairly good crops on rich land, but no farmer can make big crops on poor land. The trouble is that we are farming too many acres of poor land, and the pity of it is that we are farming more acres of poorer land each year. There must be a right about face, and, in my humble opinion, there is just one straight way—and that is—use freely the cow pea, the greatest restorative crop of any agricultural section. In order to make this great restorative crop also a money crop, we must have live stock to convert it into meat, and there is no class that so perfectly “fills the bill” as the hog.

The first mile stone on our road that leads to rich land will be marked “corn and peas”. This interpreted will mean a well prepared and well worked **big** field of corn, laid by thick in peas.

The second mile board will read “the entire field fenced hog tight”. A good many Mississippi farmers will shy at this sign, but they had just as well get accustomed to it—they must pass it on the above mentioned road.

The third mile stone will say “abundant pasturage for hogs each day of the year”. There will be many other mile stones, plainly marked, whose directions must be followed, but we will not attempt to travel too far down this interesting road at one trip, lest our readers tire and desert.

At the Delta Experiment Station we have a pasture rotation that furnishes grazing the year around, and, with some modification, it will be applicable to the hill section. We also have accurate data as to the number of pounds of pork, live weight, that was made from a corn and pea field, grazed by hogs after the corn was gathered. We will state briefly our experience in regard to these two propositions and also give some minor details concerning the management of the hogs.

Let it be clearly understood that we are discussing the two things that make it possible for us to compete with farmers in the Central West in raising pork; namely, our winter pasture and our peas, grown in the corn as a catch crop, primarily for a fertilizer. If we are not to utilize these advantages, we might as well continue to buy our meat from our Northern neighbors, who grow almost double the corn per acre that we do. By grazing our hogs while the Northern farmer is feeding solely on corn, and by fattening on peas grown in corn (having the field fenced to permit this) we cannot only compete in price, but we can grow cheaper pork.

We use as a pasture rotation in the Delta, the following: Dwarf Essex Rape and Red Clover sown together about September 1, six pounds of the former and ten pounds of the latter per acre; sorghum, sown about May 1 in rows, thinned and cultivated as for syrup; peas planted thick in corn just before the last working.

The rape and clover will carry the hogs from the middle of October to the latter part of July, the sorghum from the latter part of July until September. They go from the sorghum into the pea field to be fattened.

When the hogs are taken out of the clover pasture and put into the sorghum, the former can be plowed and kept well disced and harrowed until September, and re-seeded for another year.

In regard to the value of a pea field for fattening hogs, we put 57 hogs into a 17 acre corn and pea field last fall, after gathering the corn, and they gained 2,893 pounds. Figured at \$.06 per pound this amounted to \$173.58, or \$10.21 per acre. As a fertilizer, when followed by cotton, the pea crop is worth at least \$10.00 per acre when cotton sells for \$.09 or above. This is not an estimate, but the conclusion of a careful test in 1907. These results, we think, fully justify the plea made above for cow peas and hogs to increase the fertility of our farms.

The pasture rotation, as outlined above, is for the alluvial or river bottom section, which grows Red Clover to perfection. It will, we think, be equally applicable to the prairie section. Where alfalfa is grown as a hay crop, the alfalfa field may be used as a hog pasture, provided it is not too heavily grazed.

For the hill section, we suggest that wheat and rape be sown together early in September. Wheat and vetch might also be tried. Use a beardless variety of wheat—the Fultz is good—One half of a bushel of wheat per acre will be sufficient. Do not undertake to have a pasture of this kind on poor land. Make it rich with stable manure, very rich, and prepare as you would for turnips. Be sure to break the land a month or six weeks before seeding and keep well harrowed.

Make two seedings of sorghum, one very early, of an early variety. The wheat will not last as long as the clover; therefore, it will be necessary to have sorghum ready early. The sorghum should be ripe, or nearly ripe, before turning the hogs in.

It must be distinctly understood that we do not claim that hogs can be raised on pasture crops alone. Some corn must be fed each day to the growing pig, the amount to be regulated by the feeder according to the condition of the hogs.

Keep the hogs free from lice, do not let them sleep or lie in dust, and keep salt and hard wood ashes where they can get it at all times. Breed for two litters a year, early spring and early fall. Feed the pigs in a separate pen. Look after the sows at farrowing time.

We suggest that Mississippi farmers raise more corn and more peas and more hogs—and cotton, lots of cotton.

HOW BEEF CATTLE CAN BE MADE PROFITABLE IN OUR STATE

J. M. ALDRICH.

Ladies and gentlemen, how to make beef cattle profitable in Mississippi is a question that has probably puzzled a good many of us, but I believe the problem can be easily solved if worked by the right rule. I believe the first thing to do is to get rid of the scrub. It costs as just much to grow a scrub as it does a well bred beef animal. Some one will ask how is this to be done when a man's means are limited, as it costs money to buy registered cattle. I don't mean for you to buy a registered herd, but I do say buy a good, registered bull (with emphasis on the good) from some of the beef bred herds, and don't be too particular about the price even though you have to borrow the money, as the bull is the most important factor in your herd. Many farmers of our state would not hesitate to pay from \$175.00 to \$250.00 for a good saddle horse, but when you ask them to pay as much for a good bull, they think you are crazy and tell you they can buy just as good looking an animal from a neighbor for \$25.00 or \$50.00.

After selecting your bull, buy as many cows as your pasture will accommodate any season, such cows as can be bought in any neighborhood in the state for \$10.00 to \$15.00 a head. Mate them with your bull, and you will be surprised at the results.

The calves from these cows, if given attention, will develop into animals of good beef conformation that will pay their way in the feed pen or will be sure to attract the attention of some feed buyer. Don't

think for a minute that you can take these calves and half starve them and then get valuable beef animals out of them, as that is out of the question. You must manage in some way to give the calf about what he needs to eat, and this can be done in various ways. The most simple, to me, is, after the calf is ten days or two weeks old, let him run with his dam on the pasture. In this way, I will guarantee that in nine cows out of ten you will have a good calf that you can put on feed at weaning time and finish him off at a year old that he will weigh 800 pounds or more, and bring top prices on the market. Any animal sold on the market has to be fat to bring the high price. My experience after selling cattle on the market for twenty years is there is never a glut of good beef on the market. Take the market reports from our markets today, and you will find there is a difference of \$4.00 per hundred weight in favor of the best beef, so try to grow the best and don't market the animal until fat.



FIG. 7—Grade Angus Calves.

You will pardon me, I hope, if by way of illustration, I relate a little of my own experience on one of the old farms in the hill counties of North Mississippi. I think it was the fall of 1902 that I put my first crop of grade calves in the feed pen, eighteen of them, I believe, fourteen steers and four heifers. The youngest one when put in the pen was less than nine months old; the oldest, fourteen months. They had never had any feed except mothers' milk and grass on the pasture

until put in the feed pen. These calves I fed on hulls and meal for 100 days. After about ten days, they were eating 4 pounds of cotton seed meal and 18 pounds of cotton seed hulls each. The last thirty days, they ate 5 pounds of meal with about the same quantity of hulls as before. On the market, the eighteen averaged 850 pounds; the lightest one weighing 725, the heaviest one 1,100. Of course, there is nothing remarkable about this, only it is so much better than could be done with scrub cattle under the same conditions. The steers in this lot brought 5 1-2 cents per pound, the heifers 5 cents per pound, topping the market on day of sale 50 cents per hundred over any cattle on sale in Texas or Mississippi and \$1.00 per hundred over any sale for heifers. These cattle were sold on the New Orleans market. In the same load I had native three-year old steers fed 100 days, and I thought them good that were a drag on the market at 4 to 4 1-2 cents per pound. Each year since then, I have topped the market with my yearlings, the heifers always selling within from 1-4 to 1-2 a cent per pound of what the steers bring.

Another great reason I feel that it is profitable to grow beef cattle in our state is that I know of no way by which our worn lands can be so easily reclaimed as by pasturing them. Whether you sow grass on these lands or not, they are soon covered with a nutritious grass that has proved the salvation of our state, lespedeza, and after pasturing these lands three or four years, they will produce crops almost equal to virgin soil. Now, if any of you doubt this assertion, when you go home, make up your mind to try the experiment, even if on a small scale. Fence off some of your land, put some cows on it for three or four years, and I am satisfied when you cultivate that land you will be a thorough convert to cows and grass.

We have one drawback to the beef industry in the state, the fever tick; and by directing our efforts in the right direction, I believe that within a very few years we will be able to part company with the little fellow. I hope at the meeting of our next legislature that every farmer in the state will write a personal letter to his representative urging him to use every effort possible to secure an appropriation for funds to commence a fight on the tick. Our sister state, Tennessee, is making strenuous efforts to rid the state of the tick, and I expect to see by January 1, our state line the quarantine line for several of her Western counties. Many of you have probably shipped cattle to the St. Louis market and have noticed that even before leaving home your car has a placard on it, and in bold type you see these words, "Southern cattle, from prohibited district", meaning that when they reach the market

they are to be put in pens reserved for southern cattle, known as quarantine pens, meaning that these cattle have to be sold for immediate slaughter. Is it any wonder that the buyer takes advantage of these conditions and will not pay the same price per pound for these cattle as for animals of the same class in the native pens? Is it not worth our while to make up our minds that the tick must go, even though it takes five or ten years? Some of you may be skeptical enough to say this tick scare is all a fake. My cattle have had ticks all their lives. Granting this to be true, my friend, take my advice, don't buy any cattle that have no ticks on them to graze with your tick-infested cattle unless you have money to throw away, or I fear by the first of November you will have had more experience than you have cattle. You have always heard it said that "A burnt child dreads the fire". Now, I am in that class, as well as others whom I could point out in this audience, and I believe they would, if asked, indorse what I say, or rather, admit that they would have been hundreds, yes, thousands, of dollars better off had it not been for our enemy, the tick.

Now, in conclusion, I want to say that I don't believe the sun shines on a country better adapted to the growing of good beef cattle, if we will only take advantage of our condition, cheap lands that will grow a variety of nutritious grass, a climate where cattle will make their own living nine months in the year, geographically situated so that we are accessible to Northern or Southern markets. Surely Mississippians are blessed in many ways, and God grant that the time is not far distant when she will be recognized as one of the best beef producing states in the Union.

DRAINAGE.

BY VAN H. MANNING, UNITED STATES GOVERNMENT SURVEY.

I am present today with you not to impress upon you the importance of drainage, for I believe it is a fact well known and appreciated by all thinking men in this alluvial country that drainage is a necessity, but I am here to tell you what another sister community is doing and what it proposes to do.

With the advent of the boll weevil in the Mississippi Valley, the necessity of drainage and the reclamation of swamp lands, has been forced upon the planters in those localities in which this pest has appeared, and whose silent but merciless warning to those who await his coming, if not heeded in time, will cause devastation and ruin to a land whose fertility of soil has no superior. Already the scientific fiat

has gone forth to the localities to which the weevil is wending his way to prepare for him, and there is no surer way to destroy this menace to the prosperity of this magnificent and glorious Valley than by the preparation of your lands for all commercial purposes, and not to depend upon the one great commodity which will be so seriously ravaged.

The greater demand for a diversity of agricultural products is obvious in these localities, as evidenced by the activity of the weevil, and with equal force are the planters awakening to the situation by demanding a preparation of their lands to meet the conditions which, through no fault of theirs, will become devastated unless radical and prompt action is taken.

Never before has the potent fact of the necessity of drainage been so forceful to you planters, living in the bottom lands of the Mississippi, as now, and the great cry of the West, "Millions for Moisture!" is here paraphrased, moisture for the millions.

A paternal government is making fertile the barren lands of the West, and this same paternalism should be exercised over the lands which by drainage will create diversities in crops and population. Towards this end many bills have been introduced in Congress, which if enacted into law will produce an improved condition of affairs throughout the reclaimable areas of the overflowed and swamp lands.

Various states have passed laws, which are inadequate in many cases, because of the lack of unison on the part of the land owners to determine a comprehensive plan to improve the natural waterways and afford protection to lands from overflow.

A co-operative plan is a most vital point in any drainage unit, and this unit should be determined by the drainage basin to be controlled. It is obviously essential to adjust the canals and natural waterways to all the conditions which may arise, for example, the carrying capacity of the ways during the flood season, which by the shortening from tortuous courses to straight channels will increase the volume of water, thereby increasing the liability of the occurrence of floods in the land below, and the benefit to one locality might entail serious damage to another; therefore, the effect of drainage would be subversive.

The necessity for extensive topographic and hydrographic surveys covering the drainage basins and the impossibility of accomplishing drainage by individual effort is nowhere more evident than in the Upper Yazoo Delta. The area of lands subject to drainage was so vast and the natural drainage channel so complicated, the necessity of a

large comprehensive plan was conceived by Major T. G. Dabney, Chief Engineer of the Upper Yazoo Levee Board.

The drainage acts of Mississippi did not provide funds for the necessary surveys and to remedy this, and other serious defects in previous legislation, there was presented to the Mississippi Legislature an act, which was approved on March 2, 1908, creating the Tallahatchie Drainage District, comprising an area of 1,150,683 acres or about 1,800 square miles, the District now known as the Upper Yazoo Levee District. The following features of this bill are worthy of note:

The Commission may make agreement with the United States Government for making topographical surveys of such district.

The Commission is empowered to enter upon and take such lands, or parts thereof, as may be necessary for its purposes.

The Commission to require a complete survey of the entire territory.

The Engineer to fix and define bounties of all drainage units and make a map of same.

When all surveys, estimates, maps, etc., are approved, the Commission may proceed to have work completed as speedily as possible.

The Commission to pretermitt work on drainage unit where petition is filed against same, unless the majority file counter petition.

The Commission to appoint three free holders to serve as a Board of Assessors for drainage district, who shall hold office contemporaneously with the Commissioners, who appoint them, and who shall assess the value of betterment of all lands in said district.

A roll of this assessment shall be furnished to the Commission, who are required to hold meetings for the purpose of hearing objections to the assessments.

The Assessors are to make assessment of town lots likewise according to betterment of drainage.

The assessments to be made once in every four years.

As main trunk drains and separate drainage units are completed and cost estimates made, the Assessors are to make two separate rolls of lands, town lots, and railroad property in each unit.

A uniform tax of 7c per acre is levied on lands in the District, collectible annually. There is a uniform betterment tax and it is levied and assessed on each and every acre of land and town lot in said District for the purpose of defraying the cost of administration, the preliminary topographical survey, and the engineering expenses of said District.

An additional tax is levied also on account of the actual benefit or increased value of the property involved, not to exceed 10 per cent. in any one year.

The Commission may reduce the acreage tax if deemed advisable, and may increase same again, but not to exceed 7c per acre.

The Tax Collectors to collect the drainage taxes at the same time as other taxes are collected, and in case of default in payment of same, lands to be sold as delinquent tax lands are now sold.

A special tax may be levied on lands in separate drainage units, not to exceed 10 per cent. in any one year of the betterment, that said lands by reason of the drainage system of such unit, over and above the betterment the same receives from said main trunk drain or drains. This tax to be applied exclusively to payment for work done in that particular drainage unit.

The Commission is authorized to issue bonds not exceeding \$500,000.00 for the purpose of constructing and maintaining the main trunk drains.

These bonds are to be negotiable as promissory notes and may be sold, negotiated in any market in and out of the state at not less than their par value.

The Commission is not to make contracts for any work under this act, unless sufficient funds are in the treasury to pay the obligation in full.

Special bonds for each drainage unit may be issued in an amount, not exceeding 20 per cent. of the value of all the lands in such unit, as fixed by the assessment for State and County taxes; said bonds to be redeemable in not less than ten years after the date of their issuance.

The Commission is to set aside a certain portion of the revenues derived from taxes to be kept as a sinking fund to pay bonds and interest.

The Commission was authorized to borrow \$100,000.00, or as much thereof as was necessary to enable the Chief Engineer to make the surveys as soon as possible after the enactment of this law. The Governor of the State and the President of the Commission acting under the authority of this act, entered into an agreement with the Director of the United States Geological Survey on a co-operative basis. The Tallahatchie Drainage Commission agreeing to pay two-thirds of the costs and the Director of the United States Geological Survey about one-third of the cost of the topographical survey during the fiscal year 1908-09. The total amount expended to date is about \$40,000.00. About 450,000 acres have been completely surveyed to date.

Injury to any drainage works or ditches is punishable by fine and imprisonment.

Rights of any existing organization is not affected by this act, but the Drainage Commission is authorized to treat with such local organizations, and shall have power to re-imburse them for work done, or expense incurred by such local organization.

The President of the Commission is required to make a Report to the Governor of the State annually, and the Governor is authorized to appoint a committee any time to examine the books and affairs of the Commission.

If any person shall enjoin the collection of any tax provided for in this act, and shall fail to perpetuate said injunction, he shall pay, in addition to costs, double the amount of taxes enjoined.

The right to cross any public highway is conferred upon the Commission.

The Tallahatchie Drainage Commission was declared by this act to be a department of the State Government.

I am informed that the "drainage law of Louisiana provides that the Police Juries of the several Parishes may divide their Parishes into Drainage Districts, and they shall have power to appoint three Commissioners, and the Governor of the State shall appoint two Commissioners from a list of names recommended to him by the voters in the Drainage District. These Commissioners shall own real estate to the value of \$1,000.00 and be electors in the District in which they are appointed."

The work of mapping the United States has been entrusted by Congress to the U. S. Geological Survey; this is the one organization, whose business it is to prepare a map or atlas of the entire country, and it is now, and has been, since its establishment in 1879, engaged continuously on this work. So far, it has surveyed about one million, fifty thousand square miles, exclusive of areas surveyed in Alaska, or more than one-third of the United States.

The maps show the topographic features of the land, such as mountains, hills, valleys, gulches, bayous, sloughs, and swamps; all bodies of water, such as lakes, marshes, streams and springs; the routes of travel, such as railroads, wagon roads and trails; political boundaries; cities, towns and permanent buildings; and the names of natural and other features. They also indicate exactly the location of permanent survey monuments and bench marks, whose positions and elevation above sea level have been determined by precise methods—monuments that are available as starting points for local surveys. The maps of areas covered by public land surveys show all township and section lines, as well as the boundaries of all land grants.

Each of these maps is printed in three colors—black for cultural features, such as boundary lines, roads, railroads, houses, towns and cities; brown for the topography, or the element of elevation, indicated by contour lines, showing the heights of all parts of the area above sea level; and blue for the water—the rivers, lakes, the sea and its bays and inlets.

These maps are used by all Departments of the United States Government. They are also used by the States in connection with the co-operative agreements of the United States Geological Survey, or with other Government Bureaus.

By State Geological, or other surveys.

By State agricultural colleges.

In good-roads investigation.

In connection with legislation involving county or town boundary lines.

In connection with legislation involving the granting of charters, rights, etc., where a physical knowledge of the country is desirable or necessary.

By Engineers, for whom maps serve the general purposes of preliminary surveys.

For location of railroads, canals, highways, trolley lines.

For providing a water supply for municipal use or for power.

In connection with problems involving land drainage or irrigation.

In connection with sewerage systems.

By miners, in prospecting for and locating mineral deposits.

By educational and scientific institutions in many ways.

As a means of information.

By land investors, through map representation of local conditions.

By travelers or tourists as guide maps.

The first essential step towards a complete reclamation of your bottom lands has been taken in the construction of the levees to protect the lands from the mighty Mississippi River.

The next step is the drainage system of a territory, which, in extent, is an empire in itself.

The matter of irrigation for such products that require more moisture than is provided by precipitation, is one of serious consideration, which in this particular locality may be designated as a co-ordinate of drainage, and the most important feature of such problem, covering a widely extended territory, is the detailed information furnished by a

topographic map; for this map will develop opportunities for simple engineering, previously unsuspected.

The peculiar physiography of the alluvial bottoms of the Mississippi Valley is interesting both to the geologist and the agriculturist. The problem of diversifying in agricultural pursuits will be met with success, for the average American citizen knows no defeat.

Apply the principle of drainage to this already glorious Valley, and your eyes will open upon a scene of rare delight.

THE MOST IMPORTANT FACTOR IN DIVERSIFICATION.

(An Address delivered at Natchez, Miss., November 25, 1905.)

BY WILMON NEWELL, ENTOMOLOGIST, LOUISIANA STATE EXPERIMENT STATIONS AND CROP PEST COMMISSION.

Mr. Chairman, Ladies and Gentlemen: It has been my privilege to attend Institutes in nearly every Southern State and in many sections of the country where agricultural education is supposed to have made more progress than here. I must say, however, that I have never seen in any locality, North or South, such a rapid growth in interest and progress as is manifested here in the vicinity of Natchez. Two months ago you held here the first Farmers' Institute in your history, and today you are holding one of the largest and most successful Institutes ever held in the Southern States. To the outsider this shows a rapid development and a determination which augurs well for the future agricultural prosperity of this section of the South.

On the occasion of my last visit here I discussed with you some of the more important features of the boll weevil problem. I do not wish now to repeat what I said then, and, besides, there are other speakers present at this meeting far more competent to discuss the boll weevil than I am. I have, therefore, chosen another but closely related subject, and one which has a most important bearing upon the ultimate solution of the weevil problem. In discussing the "most important factor in diversification" permit me to reiterate the opinion I expressed from this platform two months ago, namely, that it is necessary to our future prosperity that the South retain its natural monopoly of the world's cotton production. Also that it is necessary for the farms of the South to continue producing the staple at low cost and selling it at comparatively a low price lest countries of cheap labor be encouraged to establish the cotton growing industry themselves, and having once

established it, take from us the monopoly which we have so long enjoyed and of which we so proudly boast.

I am going to speak briefly of the cattle tick, or Texas fever tick, a creature well known to all of you. I shall try to show you how the elimination of this pest from our Southern States is necessary to our retention of that monopoly on cotton culture, how the extermination of this tick will enable us in the future to successfully combat that other pest, the boll weevil, and how the eradication of the cattle tick will make more profitable the production of other crops—how, indeed, the successful culmination of our plans to destroy the tick will cause this Southland to blossom as the rose, to become the garden spot of America, and the most prosperous agricultural country on the face of the earth.

Referring first to our natural monopoly on the production of cotton, allow me to quote that distinguished cotton planter and stock raiser, Mr. August Mayer, of Shreveport, La., who says:

“The point which I wish to make clear and bring prominently to your attention is this: That the eradication of the cattle tick is a necessity in order to maintain the future undisputed supremacy of the United States in the production of cotton.

“I will say that at the present and in the immediate future the cattle tick, as an indirect enemy to the cotton industry, exceeds in importance the muchly and justly dreaded boll weevil, and that, as an enemy to the cotton industry, the cattle tick constitutes from now on until it is eradicated from our cotton-producing states, a more important factor in our national economy than it does directly as a hindrance in the production of live stock, notwithstanding the enormity of the damage caused by it in the latter role.

“The chief industry of the the Southern United States should and must forever be the production of cotton, for more than one reason.

“First, among all known lands ours seems best suited to the growing of this one great world necessity.

“Second, it is the product which makes foreign countries yearly our debtors in the interchange of goods.

“Third, cotton, among all products of the earth brought forth directly by the soil, is the one most ideally adapted for a country's export, because by the exportation of the cotton fibre we do not rob our soil of any appreciable amount of fertility, which cannot be said of any other exported product of the soil. The sending abroad of our

surplus cotton, is, therefore, all gain. The energy of our agriculturists ought, therefore, to be persistently directed to the growing of cotton as their main crop. This should be the policy of our government. We should never permit our supremacy in this field to be put under a cloud for a moment. The fear occasioned recently by the advent of the boll weevil in our country, that the United States would in the near future, sooner or later, be incapable of furnishing what cotton the foreign spinners need, has caused greater activity in foreign lands in growing the crop which is America's greatest export, and to which is due our country's healthy bank account in those foreign countries. This fear should be dispelled once and for all, to hold what we have for all time. How can we do this? I say: "Eradicate the cattle tick."

"As will be seen, the preparation of the soil—the seed bed—before planting, is the most important factor in the successful raising of cotton. The proper preparation of the soil, its physical condition, for the reception of the seed, and thereafter the growing of the cotton plant, is very largely dependent on the humus contained in the soil. If the soil has been deprived of this vegetable substance it is very nearly sterile and valueless as a producer of crops. Fields continually planted in one crop will eventually have no humus left in them (and thus become profitless to the farmer), unless the necessary humus is regularly restored by fertilization and rotation of crops. No fertilization is equal to that brought about by the use of stable manure or that due to the feed lot. It will restore the soil better than any other fertilizer, specially if rotation of crops is practiced also. To secure, therefore, the greatest requisite to successful cotton planting, i. e., perfect preparation of soil and favorable soil conditions, we should have fertilization with stable manure. To have stable manure we must have live stock, especially cattle, to utilize to the fullest our cotton seed and the roughage produced by a soil-conserving agriculture. To have cattle we must be rid of the parasite fever tick.

"The second essential in the successful culture of cotton (in a weevil infested territory) is the proper fertility of the soil. It is quite a mooted question as yet in how far chemical fertilizers do contribute to soil improvement, especially if used alone for a long period of time. Aside from the objectionable feature of great cost, chemical fertilizers must also be objected to in that they do not restore humus, i. e., 'life' to the soil. To properly fertilize the soil so as to bring about this second most necessary feature of the successful production of cotton in the weevil infested country we must have a healthy live stock industry, consisting mainly of cattle.

"Cotton should and will forever remain our chief crop. It is the ideal crop for the South. It is the ideal crop for a country's export. Its continued exportation will only make our country richer with every year; for, if we should send twenty million bales of cotton—pure cellulose—abroad each season, equivalent to ten thousand million pounds—or even on a still greater scale—we would not send along with it enough of our soil fertility to decrease our yield any for a thousand years to come. But our ships would return with the foreigners' gold to the tune of one billion dollars per year—all this and much more, only,—provided, we exterminate the cattle tick.

"To maintain our cotton industry in its supremacy is but the soundest statesmanship. To keep the cotton crop at its supremacy in the United States is statesmanship equally renowned. To maintain and ever increase our cotton exports should be our government's never-failing policy. Such aim will make us permanently the creditor nation of the world. To export cotton—cellulose—is truly a country's ideal business with a foreign people, for there is connected with it no loss—all is gain.

"Eradicate the cattle tick!"

Most of us imagine that our rich lands need no fertilizer, and that none will ever be needed. Reflect for a moment that countless generations of humanity must yet derive their living from these same soils, and remember, too, that each year's crop removes more plant food than is, under our present system of farming, returned to it. The final result can be but one thing, an impoverished soil, and with it an impoverished people. The fertility must be conserved, even increased, and this can be done only by a system of farming which embraces as its central feature the liberal production of live stock, particularly cattle.

The plant food—nitrogen, phosphoric acid and potash—which is in the grass and grain eaten by live stock is not converted into meat and bone, but over 80% of it is returned to the farmer in the manure. Some one has said that when the farmer sells cattle, he sells mainly what has been elaborated out of wind and water, and it is not far from true, for the potash, phosphoric acid and nitrogen which the soil needs for future crops, have been returned to it.

We have referred at length to the necessity of having stable manure and humus in our soils for the continued profitable growth of cotton. The same manure and the same humus—decaying vegetable matter—are needed in our soils for the profitable production of the truck, grain, fruit, and forage crops which will be henceforth included in the diver-

sification plans of every successful farmer. We are, therefore, brought face to face with an immutable fact: we must raise live-stock, raise it on a larger scale, and raise it successfully.

Let us see what is necessary in order to have a successful live-stock industry. Five things: good breeding stock, protection from cold, good markets, plenty of forage and feed, and protection from diseases and parasites.

First of all, we have not the best breeding stock in the world, principally for the reason that Northern-bred cattle imported into the South invariably die of Texas fever given them by the cattle tick. At the same time there are many breeders of good beef and dairy types in the South, and it is not difficult to obtain good high-grade breeding stock which is "immune" to the Texas fever.

The Northern farmer and stock raiser builds enormous barns and houses his stock for from two to five months of the year to protect them from the winter weather. Here, Nature has provided a warm winter and the stockman does not have to incur the enormous expense of building sheds and barns. In this respect we have a decided advantage over the Northern farmer.

We have not the best market in the South, nor do we receive the highest market prices for Southern cattle, no matter how perfect their condition. The reason for this lies in the existence of the so-called Federal quarantine line, which prevents the shipment of Southern cattle to the North only during the winter months, except for immediate slaughter. When your Southern cattle go north, they go in a car labelled in big letters "Southern Cattle" and when they reach the market they are unloaded into quarantine pens, again labelled "Southern Cattle". Under Uncle Sam's quarantine law they must be sold within a certain time after reaching the market, which places the shipper at the mercy of the stock-yards buyer and the cattle are not sold for what they really are worth, but for what the buyer sees fit to give. The Federal quarantine line is the Northern limit of the area occupied by the cattle tick, and it is a necessary line, else the Southern cattle going North without restriction would spread death and destruction wherever they carried ticks. The low price of Southern cattle in Northern markets, is reflected in our Southern markets and works a loss to the farmer who sells even to the butcher in his home town. When the tick is eradicated from the South there will be no quarantine line, for there will be no ticks to quarantine against, and our cattle will then sell upon their merits against all competitors.

In spite of these disagreeable considerations there remains the consoling fact that our home markets are good and there is ample demand and good prices for good cattle, ticks or no ticks. The State of Louisiana imports thousands upon thousands of dollars' worth of cattle each year to feed her people. Louisiana does not produce more than a small per centage of the beef consumed by her citizens.

When we come to consider the available food-stuffs for cattle, I venture the assertion that nowhere in the United States is forage and pasturage so abundant as here, and nowhere can hay and forage be produced at lower cost. Our lands are cheap, and besides our many native grasses, we have alfalfa, lespedeza, sorghum, Kaffir corn, crimson clover, stock beets, Indian corn, milo maize, and other crops which grow luxuriantly, and most of which will produce from two to four crops per year. Besides these, we have cotton seed meal, hulls, rice, bran, molasses and other cheap but valuable by-products which are available for feeding and fattening our cattle.

For dealing with contagious diseases of live stock, Louisiana has a State Live Stock Sanitary Board and Mississippi has a similar organization, both recently created. Neither has as yet been provided with funds sufficient to effectively fight the tick. Given all these advantages in the way of a mild climate, abundant pasturage, cheap feeds and fair markets, why is it that our cattle have not waxed fat and the farmer pocketed a handsome profit each year from his beef and dairy cattle?

Have you noticed cattle in mid-summer, belly-deep in tall luscious green grass, and yet as thin and poor as a rail, just at the season when they should be rolling in fat? Did you look a little closer and see thousands of ticks of all sizes all over each animal? Have you ever paused to reflect that each tick draws from the cow or steer at least once every twenty-four hours an amount of warm fresh blood exceeding in weight its own body? Count the ticks on the animal, then multiply that number by the amount of blood each consumes, and you will see why the grass does not make your cattle fat. How fat would you be with thousands of ticks all over you, drawing from a half pint to a pint of blood from your body each day? The fact of the matter is you have not been turning grass into beef, but rather you are utilizing the cow as a machine which turns grass into blood with which to feed and fatten ticks.

Every year thousands of cattle in Louisiana and Mississippi die suddenly and without warning, from attacks of Texas fever. Here and there are farms or premises on which there are no ticks. Cattle

raised on these tick-free areas fail to become immunized by getting ticks upon them while they are calves and when, later in life, they are taken to tick-infested areas, they contract Texas fever with fatal results.

I would candidly advise every man not to engage in cattle raising without first familiarizing himself thoroughly with the habits and life history of the cattle tick and the relation of this pest to the Texas fever. With this knowledge at his command he can avoid absolutely the disastrous losses I have referred to.

We have seen how this tick has handicapped the Southern cattle raiser at every turn, lowering the market price, preventing the importation of the best breeding stock, slaying thousands of cattle by giving them the Texas or acclimation fever and keeping all of them from putting on flesh and making even a reasonable growth. The tick is the mill stone about the neck of the Southern farmer. What is to be done about it?

Fortunately there is "something doing" already, and with your support and energetic work there will be much more "doing."

During the session of 1905-06, Congress at the earnest solicitation of southern representatives, chief among them Congressmen Ransdell and Watkins, of Louisiana, appropriated seventy-five thousand dollars wherewith the U. S. Department of Agriculture should help the Southern States eradicate this cattle tick. During the year following no less than fifty thousand square miles of territory adjoining the Federal quarantine line were freed from the pest. This magnificent work was followed by an appropriation, at the session of 1906-07 of \$150,000.00 and the last Congress (1907-08) appropriated the princely sum of two hundred and fifty thousand dollars for this work. The policy of the U. S. Department of Agriculture in its manner of expending this money is a wise one. For any Southern State to get a part of the benefit from this fund that State must itself expend money in eradicating the cattle tick. Louisiana is already in line and in co-operation with the Federal Bureau of Animal Industry is now eradicating the cattle tick in Lincoln and Claiborne Parishes. Already the condition of the cattle in those parishes is greatly improved and, encouraged by the diminishing numbers of their worst enemies, the farmers are getting better breeding stock and are raising more cattle. The eradication of the cattle tick is far more important than the warfare against the boll weevil. The tick can be exterminated for it has no wings and can move only as carried by the cattle themselves. The boll weevil will be with us always, but his strongest ally now is the tick, and when we shall have exter-

minated the latter then will our warfare against the weevil be a far easier one than now. If every farmer would study this matter in all its seriousness and realize what a tax he pays to this tick, the farming public would demand that Southern legislatures appropriate, not a few hundred or a few thousand dollars for tick eradication, but hundreds of thousands of dollars.

With three years of work and the expenditure of about a half million dollars the tick has been eliminated from about a hundred thousand square miles of territory. You have only to calculate the area of the Southern States and with these facts before you figure out how much it will cost, and how long it will take, to entirely and permanently rid the South of this expensive pest.

Having now heard what has been accomplished in this direction on and having heard what the Government and the several states propose to do, the question naturally suggests itself: "**How** are the ticks to be eradicated—how are we to destroy them on **our** cattle and on our farms?"

A brief knowledge of the tick and its mode of development is first necessary.

Ticks, like most other living creatures with which we are familiar, are of two sexes, male and female. It is the latter which comes most prominently to your notice as you examine an infested cow or steer. It is the females which reach such an enormous size, and, of course, it is the female which deposits the eggs. Allow me to explain right here that ticks do not "burst open and the little ticks crawl out." That is merely an old superstition which has been exploded and which you can readily disprove by putting a few full grown ticks in a glass and keeping them in a warm room for a few days. They will deposit eggs each female laying from 1,500 to 4,000. If kept long enough in a warm room, about twenty-one to thirty days, the eggs will hatch into baby ticks or seed ticks—but before they hatch you had better remove them from the house!

The same thing occurs out-of-doors. The engorged female ticks drop to the ground and lay the eggs. The eggs hatch into small ticks about the size of a small pin-head and these crawl up on the nearest blade of grass where they await the passing of some bovine animal. To this they attach themselves, find a suitable place on the animal's hide, and commence sucking blood. They grow rapidly, molting from time to time, as their skins become too small for them. The females reach maturity in from twenty-two to forty-five days after attaching

to the animal, the time being dependent upon the prevailing temperature.

Eggs and seed ticks are found always on the ground, never on the animal, while the developing males and females are found always on the animal, never on the ground.

It has been found that if all cattle be kept out of a pasture for three months in summer, or six months in winter, all the eggs will have hatched and all young ticks will have died of starvation, hence we have here a way to free any given area of the ticks themselves.

There are two practical methods of eradicating the ticks from a herd of cattle, the so-called "greasing" method and the pasture rotation method. The former method is the simplest and is reasonably certain as to results if followed persistently and periodically. The cattle are caught up every two weeks and thoroughly greased all over with crude petroleum or "Beaumont oil". This kills the majority of the ticks, and if this be repeated every two weeks no ticks will reach maturity, and in time all the living ticks in the pasture will be gathered up by the cattle and destroyed by the greasing process.

The pasture rotation method has many possible combinations and I will take your time to describe but one of them, known as the winter rotation. Let us suppose that we have three fields, one a cotton field in cultivation, and the other two pastures containing tick-infested cattle. Let us start in the month of June of this year. Before June 30th, we remove the cattle from one of the pastures (which we call No. 1) and place them with the cattle in the other pasture (No. 2). We will keep all cattle out of Pasture No. 1, and by October 1st, all ticks in it will be starved out; it will be a "tick-free" pasture. Having accomplished this much, let us turn our attention to getting the ticks off the cattle themselves. In December we take all cattle out of pasture No. 2, and place them in the cotton field. Here we leave them until the middle of February. All ticks upon them gradually mature and drop to the ground, but owing to the cool weather the eggs which are laid do not hatch and no ticks get back on the animals. By February 15th, they are free from ticks, and then we transfer them to the tick-free pasture No. 1. Thereafter they remain free of ticks until allowed to go upon ticky pastures, or until ticky cattle are placed with them. The ticks remaining in the cotton field and in pasture No. 2 are next destroyed by putting these in cultivation for a season or for keeping all cattle out of them for six months.

HOW TO MAKE TRUCK FARMING A SUCCESS.

BY J. W. DAY.

When a person desires to take up fruit and vegetable growing as a profession, he should acquaint himself with what would be required of him to make a success of it, and carefully weigh himself and see if he is equal to the emergency or not, as he ought to do in any other calling he might be considering. After he is fully determined to go into the fruit and vegetable growing business, as the case might be, this much determined, the next most important step will be the right location. For instance, if he should desire to be a melon grower, or a peach, or a grape, or a pear grower, he should select certain kinds of land with a sufficient altitude for these special crops. Probably the most ideal land and location would be high, dry, sandy and gravelly land with clay sub-soil. Of course, such land should have sufficient drainage. If one should choose to grow such crops as apples, berries, potatoes, tomatoes, cabbage, lettuce, beans, etc., he should select practically level land with clay sub-soil, being naturally or artificially well drained. Flat, wet soil, for any kind of truck growing, should be avoided. If there is any kind of fruit or vegetable that will do well on such soil, it is the strawberry. If the ridges are made high as the season progresses and finally laid by with deep water furrows, such land will be all right for berries, as they need plenty of moisture all along from planting time to gathering time, or nearly so. I might say there are two methods of growing strawberries in this state and in Louisiana, which I will not take up just now. To make a success of truck growing, one must be a hustler. He must be quick to learn, both by experience and observation, be a reader of all the literature he can get on the subject on the special line of work and crops he intends to grow and is growing, and above all, he must converse freely with some one near by who has had experience along this line. For instance, it would be worth \$1,000.00 to you if you were a lettuce grower to know what variety to grow, what land is most suited to it, when to plant in your locality, and what fertilizer to use. It would be equally as profitable to you if you were growing a commercial onion crop to know just these four questions, to say nothing of the minor questions; and I venture to say there is always some one near by who can give you the desired information if you can pump it out of him; but, unfortunately, there are a great many people who get all they can and give as little as possible, but such people are no benefit to the country.

To say that I have made many mistakes in fruit, vegetable and truck growing from a financial standpoint is putting it mildly, but I

hope my mistakes may be of benefit to others. Probably the greatest mistake in my whole career was trying to grow too many kinds of fruit and truck at the same time and on too extensive a scale. When a person overloads himself, he does his work too hurriedly to get the best results, and, naturally, neglects to do many things he knows ought to be done for the benefit of the crop and his purse. This season I am growing 117 different kinds of crops. Some of these crops have from 25 to 35 different species. This I am doing more for a curiosity and for exhibition purposes than from a financial standpoint. A few more of the staple crops, such as corn, cotton, tomatoes, cabbage, beans, berries, etc., I am growing for profit.

Now, from what I can see, and from the signs of the times, the future for the trucker is just as bright as the past, or more so. Fruits, vegetables, and nuts, are becoming more of a necessity in our everyday diet than ever before, and the day is not far distant when there will be millions of pure vegetarians. I might cite to you the fact that fifty years ago there was not consumed in the whole United States one carload of tomatoes, now there are shipped yearly over 5,000 carloads from the South, to say nothing of home consumption. Thirty years ago not a carload of peaches found its way from the South to Northern markets. Now there are shipped yearly over 5,000 carloads to the North. The same might be said of bananas, pineapples, strawberries, melons, beans, and peas; but I deem this sufficient to show the great demand constantly growing for our stuff.

I think any young white man in the South should get him a small farm at once, even if he should have to buy it on a credit. Credit is all right, if one uses it right—it is the poor man's capital. If one uses good judgment and gets value received for what he promises to pay, he is all right; as land will always be worth more tomorrow than it is today, and if you fail after an honest effort, you are no worse off than you were before, and then you have every possible advantage. When you own a small farm and everything is neat and well tilled and cared for, you and yours will, or should, be happy. I would suggest that you take up just a few crops you fancy you would like to work at and you know the land is suited to, always having in mind the market and transportation facilities. There will always be ready sale for good to fancy products at a good price, but I am sorry to say that through ignorance, carelessness, and dishonesty on the part of the shipper, the market is almost always overloaded with a poor and worthless article put up in a deceptive way. Then, when it is possible for you to do so, you should belong to a truck growing and shipping association, and

pack your products subject to the inspection of the buyers. We would prefer to have these buyers at our end of the line, and I am proud to say it is becoming more popular every season.

Now, to sum it all up, what I think would be necessary to make a success of the trucking business both in in profit and pleasure, is about this: first, be the man for the business or let it alone; that is, you should be a hustler, you should desire to build up a profitable business and have a bank account eventually. You should impart your knowledge freely, in success or failure, to your neighbors and the press. You should not be content until you own your own land and a cozy home surrounded with fruits, vegetables, stock, poultry, and flowers. Grow what seems to suit you best and your land best and what there is a profit in. Keep the fertility of your land up by the liberal use of fertilizers and the turning under of all vegetation including weeds instead of burning it. It will pay you big to do this especially when you use commercial fertilizer in connection with it. Good preparation of the soil and through tillage are essential. Endeavor to pack an honest package and always sell at home when possible. Be honest, industrious, and wide-awake, and, my word for it, you will succeed. A man who has no tact for looking after small details around the farm should never go into the trucking business.

FARM FORESTRY FOR MISSISSIPPIANS.

BY GEORGE L. CLOTHIER.

In a region of natural timber growth such as Mississippi, the pioneer population is likely to be wasteful of forest products and destructive of forest resources. The tree has become an object of contempt because it has been in the way of the plow. After nearly a century of relentless warfare against the forest, the people of Mississippi have succeeded in bringing less than one-third of the area of the state into cultivation, although at least two-thirds of the original merchantable timber has been removed. Among promoters and real estate agents the opinion is widely circulated that almost the entire area of the state is destined to be cultivated. If this were possible, it would not be desirable, because the country would suffer from over-production of agricultural crops and ruinous prices would result. It will probably be more than one hundred years before fifty per cent. of the area of our state will be needed for cultivation. Germany, with a population eight times as dense as ours, still finds it profitable to retain forests upon twenty-six per cent. of her area. The little German state of Saxony

realizes six dollars per acre per annum from her forest lands. Before a half century rolls around in all probability there will be a greater demand for forest products in Mississippi than now prevails in Germany. In fact, at the present rate of cutting, Mississippi virgin pine will last not longer than twenty-five years, and when we remember that the same or worse conditions of exhaustion exist in every state east of the Rocky Mountains, we can begin to realize how prices for lumber will soon rise never to fall to present levels again. The Mississippi owner of growing forest trees of useful varieties, has a better investment than government bonds or even Standard Oil securities.

The great lumber industry of the past and present, in this state, has largely been in the hands of vast corporations. This condition will probably prevail until the virgin crop has been cut. Now is the time for the small holder to begin to care for and improve his forest land, because such care promises to yield large returns. There is no question that the timber supply of Mississippi thirty years from now will have to be drawn from small land owners. The large companies are making no attempts to reproduce the forest on their cut-over lands, and if they were to reform their methods now, it would be fifty to one hundred years before their efforts would bring practical results in the shape of new trees for their mills. The fate of the large saw mills in this state is doomed to be the same as the fate of similar industries in the white pine belt of the Great Lake States; because the lumber industry in Mississippi is being operated on the same short-sighted policy. When the large holders have cut themselves out of timber, the small mills and small land owners will have their "innings", and then forestry will be more profitable than cotton growing on the richest Yazoo Delta lands. The forester is a producer of timber crops in the same sense that the farmer is a producer of field crops. In the near future, every Mississippi farmer should also be a forester, particularly if he is the owner of woodland. Why should two-thirds of the area of our state be treated as waste land, when it can be made to grow one of the most valuable forest crops in the world.?

The Forestry Business Not Discreditable.

It is no discredit to any part of the state to say that a large percentage of its lands is better suited to forest crops than anything else. The information seems not to be generally public that timber, next to cotton, brings the greatest cash income into the state. Some of our people with narrow views seem to imagine that a continuation of this

great stream of money perpetually into our state would prevent the progress of civilization. Such people cannot foresee the increasing value and importance of forest products. It is almost certain that twenty years hence to say that definite types of Mississippi soils will grow longleaf pine or hickory or oak more profitably than cotton or corn will be as great a credit as to say that such lands will grow fruit to perfection. A state that can boast as varied soil types adapted to as many different crops and uses as Mississippi need not be ashamed of pine trees.

Reform of Public Sentiment Needed.

The first great change in public sentiment needed in Mississippi is for farmers to value their standing timber sufficiently to demand a price per thousand feet when it is sold. As long as prices per acre prevail, the land and not the timber is thought most of when it is placed on the market. Farmers would not think of selling a bale of cotton except by weight, yet the same individual will sell cotton by weight and standing timber by the "lump", not even taking the precaution to "estimate" it. The second great reform that is needed is to stop burning over the forest every year. The farmer should look upon his woodland as invested capital. Every time fire is allowed to run through a forest, its potential value is reduced by the destruction of the young trees, the injury of the old trees, and the impoverishment of the soil. It is strange that farmers cannot see that fire reduces the capital value of their woodlands.

Farmers need information regarding present and future values of timber. They are not aware that the best informed statisticians believe that the hardwoods of the United States will be exhausted within fifteen years. Vehicle manufacturers are now at a loss to tell where their hickory for buggy and wagon spokes will come from ten years hence. No other wood in the world can take the place of hickory for this one purpose. Mississippi probably has the largest supply of hickory yet untouched; but the spoke men are after it. When they come they will bring their old-time wasteful methods with them. They refuse to use the heart which is just as strong and just as durable as the white wood. The uninformed farmer lets the purchaser go into his woods and waste more than half the crop in the harvesting; besides, he accepts a price for the cream of his timber, which enables the manufacturers to reckon their profits by the hundred per cent. Mississippi farmers should awaken to the real worth of their birthright.

Forest Replacement.

The farmer is better able to keep his land fully stocked with young trees after the loggers than anyone else. He can fence his land and protect it from trespassers, while such precautions for lumber corporations are generally impractical. All he needs to do is to save an old-field pine tree here and there for seed to insure abundant reproduction. The loblolly pine is probably the most rapid growing species of pine in the world. It will grow on almost any kind of land and produce a saw log in less than half the time taken by longleaf. To people who have had an abundance of longleaf pine all their lives, the suggestion of sap pine for lumber does not often appeal; and yet today in Virginia and North Carolina, fortunes are being made by lumbermen in handling loblolly pine which has grown up on old fields during the past fifty years. It would be hard to estimate correctly the possible acreage value of an old field densely stocked with young pine trees approaching pole size. The farmer is better able to realize great profits on such lands than anyone else. He can attend to the replacement of the forest and protect the young growth at less expense than the large land holder. The prospects for farm forestry were never brighter in Mississippi than today.

DIVERSIFIED FARMING.

BY CAPT. J. F. MERRY, IMMIGRATION AGENT OF THE I. C. R. R.

Mr. Chairman, Ladies and Gentlemen: If there is one thing more than another for which I am devoutly thankful on this National Thanksgiving Day, it is that not one drop of pessimistic blood courses through my veins. With this statement you will not expect from my address any tale of woe concerning Bats and Bugs or Worms and Weevils. If I interpret correctly the signs of the times optimism is written on every legitimate industry in the country. We live in an age of marvelous opportunities and instead of nursing the blues, we should thank God for the 20th Century Agricultural, Industrial, Commercial and Educational possibilities of Mississippi and Louisiana.

If the soil and climate of Mississippi and Louisiana were only adapted to the growing of cotton, then the planters and farmers of this territory are fully justified in confining their farming operations to the growing of that one staple product. Fortunately such is not the case. There are scores of products grown in Mississippi and Louisiana that if given the same consideration and the same careful cultivation that has been given cotton for the past fifty years, would show equally

as good net returns; pay off the mortgages; restore the fertility of the soil; build new homes, barns, sheds, and fences; clear out the ditches and make farm home environments such that when the next President of the United States has occasion to appoint a commission to investigate the agricultural conditions of this country, he will have no excuse for including Mississippi and Louisiana among the Southern States whose farms are unsanitary and unsightly. Mississippi has an area of 29,958,000 acres and Louisiana has 31,180,800 acres of land, 90% of which is tilable and susceptible of making splendid farms and yet less than 25% of these lands are under cultivation. This, of itself, is an indirect arraignment of our farm methods for which I believe exclusive cotton growing is largely responsible.

For the past twenty years, from 1888 to 1907, the lowest average price of cotton in New Orleans was 7 74-100 cents per pound; the highest average was 10 79-100 cents per pound. It should and could have made a handsome profit each year but for the expense of operations which could have been obviated under an intelligent system of **"Diversified Farming."**

A Mississippi correspondent of the "Commercial Appeal" is responsible for the following statement: "Sixty-five per cent. of the money received for the cotton crop goes North to buy meat, mules, meal, corn, oats, and other food stuffs that are shipped to the cotton raisers of the South." I will not vouch for the correctness of this statement, nor will I even suggest that the Railroad Companies are averse to transporting these products, but I must insist that it is an awful and unwarranted tax upon the net returns from cotton, such as no single farm crop grown in the United States can stand. Cotton is one of the leading staple products of this country. For more than a half century it has been KING in this immediate territory. It is today and it will be for a hundred years to come. Your soil and climatic conditions are favorable to it; but, my friends, if we expect satisfactory net returns, we must change our present methods. We sell a bale of cotton today for \$40.00. \$26.00, or 65% of this amount is tribute you are paying to farmers, grain dealers, and packers of the West and you are left but \$14.00 out of the \$40.00 with which to pay your taxes, labor, household expenses, and your farm improvement. Is it any wonder that your environments are not all that could be desired? We have in Mississippi and Louisiana too many **large** and entirely too few small farms, and we have been making too little net money.

Forty years ago in the country in which I then lived and do now, we grew spring wheat to the exclusion of every other crop. The chinch

bug, as much a destroyer of wheat as the boll weevil is of cotton, came upon us, and well nigh bankrupted every farmer in that section. We hesitated to grapple with the situation, but there was nothing else to do; by experiments we soon learned that corn and some of the tame grasses under proper cultivation, would do well in IOWA; we found that dairying, stock raising, gardening, and the raising of poultry were industries vastly more profitable than the growing of spring wheat, and even before we had fairly changed from our one-crop system to diversified methods the dreaded chinch bug was gone, and our farmers can now, if so disposed, under our present crop rotation system, grow 25% more spring wheat per acre than when they were forced by this pest to the growing of other crops; to dairying, stock raising, etc. Today the farmers of that section are rich. They live in fine homes; their farms are in splendid condition and are selling at from \$75.00 to \$150.00 per acre. Our country banks are loaded down with farmers' surplus money on which they pay from 3% to 4% if left with them six months or more. This forced change of farm methods in Iowa has proved a most fortunate one. It opened up our eyes to the fact that Iowa was adapted to **Diversified Farming**--That it was net, and not gross returns that insured prosperous farming communities. May not our **Mississippi** and **Louisiana** farmers profit by our experience?

The Natchez Chamber of Commerce, in calling this Institute, had in mind the present farm conditions of Mississippi and Louisiana; and when they invited me to address you, it was with the expectation that I would give you the benefit of my experience and observations. For a quarter of a century, I have been a believer in, and an advertiser of the agricultural possibilities of the two states in whose interests we are met. From the rostrum, through the press, and in the distribution of millions of pamphlets and circulars published by the Illinois Central Railroad Company, I have not ceased to declare my honest conviction that some day Mississippi and Louisiana would rank among the best agricultural states of the Nation. I regard it as an omen for good when the farmers and business men of these states will leave their farms, their places of business, and their homes on a National Holiday to discuss questions of importance bearing upon this great subject.

From the earliest history of the United States, farming has been regarded as one of its most important industries; and yet, from a social and commercial standpoint, the tiller of the soil has not until within recent years, occupied a position among the world's workers to which he was justly entitled. Today, throughout the United States, no man is more respected than he who successfully grows the products that

clothe and feed the world. Various agencies have contributed toward these happily changed conditions; but none, in my judgment, have done so much to advance the farmer to his present position of prominence and usefulness, as the United States Department of Agriculture; and I suggest, Mr. Chairman, that this Institute send a telegram to the Hon. James A. Wilson, Secretary of Agriculture, Washington, D. C., expressive of its appreciation of the many and varied ways in which his Department is improving the farmers' condition. Our Agricultural Colleges and Experiment Stations, auxiliaries to this great Department, are sending out men who are scientifically experimenting with every variety of farm products to determine what can be grown most successfully and profitably in different localities. Men from the Department of Agriculture are today engaged in the two states here represented, instructing farmers and planters as to the working of the boll weevil, and advising how this invasion may be partially or wholly arrested and how the loss sustained by his coming may be reduced to the minimum.

The question of **"Diversified Farming"**, which I am to discuss at this hour, seems timely, as this suggests the profitable growing of such crops as are not relished by this pest of the cotton boll. I find myself somewhat embarrassed in discussing the question of **"Diversification,"** before an audience, many of whom have practiced for a life time the one crop theory, and have little sympathy with any suggestions of a change from the old time methods. But, Mr. Chairman, as I shall present this subject, not from a theoretical but a practical standpoint, introducing witnesses whose testimony can not be impeached, I trust that none will pass judgment on the comparisons and suggestions made, until they have carefully considered them. If I were to ask this audience the question: "What crop can be grown in **Mississippi and Louisiana?**" The reply would be, **"Everything."** And yet many of your farmers go on year after year, growing only cane and cotton, and each succeeding year their farms are just a little poorer than they were the year before. Friends, did it ever occur to you that the Creator never intended that a soil capable of producing luxuriantly nearly every variety of fruits, flowers and vegetables, and nearly every known species of grass and grain, should for a hundred consecutive years be cultivated in a few crops, annually robbed of its fertility, and in many instances pauperizing the man who owns it.

Prof. Hopkins, the great soil expert, tells us that Illinois has 99 different types of soil. No doubt Mississippi and Louisiana have equally as many, and that they will grow an almost unlimited variety

of products can be easily proved. And yet it is a lamentable fact that a large percentage of the food products consumed in these two states—all of which might be produced at home—are imported from other states.

Your flour comes from Minnesota; your butter from Wisconsin; your pork and beef from Kansas City and Omaha; your alfalfa meal from Nebraska; your mules from Missouri; your horses from Kentucky; your cows from Tennessee; and your peaches and apples from Michigan and York State.

Your explanation of this is that the states above mentioned can produce these products cheaper than you can at home; and simply because you do not care to change your system of farming and diversify your crops, you have actually made yourselves believe that you can grow cotton at from eight to ten cents per pound, and pay long distance freight on these necessities rather than to produce them at home.

Mississippi and Louisiana grow very little wheat, and I think there are good and sufficient reasons for this, but the United States report for 1907, shows that the average number of bushels of winter wheat per acre in Mississippi was only eleven bushels, while the average of spring wheat in Minnesota was only thirteen bushels. A few years since, we were told that the South would always get its supply of butter from the North, as the Southern grasses, and especially those of Louisiana, would not produce milk. Today there is being shipped from Hammond, Louisiana, to New Orleans, every twenty-four hours, 2,000 gallons of milk that will test in butter fat with the milk of any creamery in Wisconsin; and any farmer in Mississippi and Louisiana with a dozen or more cows, who is not conveniently located to the city market, can by the use of a hand separator and ordinary cleanliness, manufacture butter that will demand the highest price on the market. The greatest obstacle in the growing of beef in the South is the tick. But the process of inoculation and the methods of eradicating the tick as practiced by the Department of Agriculture, will, I believe, soon overcome this obstacle. The farmers in Mississippi and Louisiana can no longer refuse to grow cattle and hogs on the flimsy excuse that they can not compete with the alfalfa and corn growing states of Nebraska and Kansas. It was Mr. B. H. Strong, of West Point, Miss., who, in competition with Nebraska, Kansas, Colorado and California, carried off the "Gold Medal Prize," at the St. Louis Exposition for the best exhibit of alfalfa. Permit me to read a couple of letters from Mr. Strong that I think will interest the farmers of Mississippi and Louisiana.

WEST POINT, MISS., Sept. 29, 1905.

MR. J. F. MERRY,
General Immigration Agent,
Manchester, Iowa.

DEAR SIR:—Your letter of the 21st inst. at hand. I take pleasure in giving you all the information I can in regard to alfalfa in this section.

In March 1903, through the advice and direction of Prof. Hopkins, of the University of Illinois, I prepared and planted one-half acre in alfalfa. Prof. Hopkins furnished me with one hundred pounds of inoculated soil, which I put on lower slope of plot. This half acre was ready to cut for hay by the first of July, four months growth from planting, and cut one thousand pounds of fine hay. I cut it again the 15th day of August and the middle of October, just before frost. The last cutting was light. The three cuttings the first year made two and one-half tons of hay per acre. The upper half of the plot that was not inoculated showed as healthy growth and produced as much hay as the lower edge of the slope that was inoculated.

On examination of the roots, I found them covered with tubercles, showing the land to be naturally supplied with alfalfa bacteria. I then had the soil sub-soiled and its foundations rottened limestone, analyzed. From the geological formation and chemical analysis of the soils, I found the land to be the same as the chalk lands of England and France, which are said to be the best alfalfa lands known. Our soil is abundantly supplied with lime. In March, 1904, I planted 130 acres. The hay cut from this field, July 15th, 1904, was awarded the Gold Medal at the St. Louis Exposition. I have ten acres of the 130 acres in hog pasture, which has proved very profitable.

After paying all the expenses of seeding, cutting and baling the first year, the 120 acre meadow netted me \$1,075.00. From this the second year I have cut fifty acres five times, and will get the fifth cutting from all the meadow before frost. I did not have shed room sufficient this year, consequently I will lose from hay spoiling in ricks, about 100 tons. The 120 acre meadow, with all the bad weather we have had to save hay, will net me this year over \$3,000.00.

WEST POINT, MISS., Aug. 4, 1908.

COL. J. F. MERRY,
General Immigration Agent,
Manchester, Iowa.

DEAR SIR:—Your letter of August 1st, asking for results from this year's alfalfa crop, received. We have cut all the old meadow three times, and the fourth cutting is being harvested now; yield averages one ton per acre each cutting.

This spring's seeding has produced some wonderful results. We are harvesting it now the second time. On one meadow, sowed March 20th, this year, we got thirty inches growth by May 26th, a few days over two months from seeding. I sent samples of this growth to the Agricultural Department at Washington. They tell me that they have

no record equal to this growth on the natural soil and under natural conditions, as this was grown.

We lost some hay this year by stacking in the field without covering. Last year we had good results without covering, which caused us to be a little careless. All hay under shelter has come out in fine shape, selling for \$16.00 to \$18.00 per ton f. o. b., West Point.

The prospects are now good for six cuttings this year, as the seasons have been perfect, for both production and harvest. Mr. Ben Walker, a neighbor of mine, who has a 100 acre meadow, disced his field this year after the first cutting. Results were better than expected, increasing population, and in making quick growth. He harvested his fourth cutting ten days ago. His fifth cutting is now four inches high.

Good alfalfa lands are selling as high as \$50.00 per acre. A meadow, well-set, sold this spring for \$75.00 per acre. This was a forty acre lot. 1,940 acres, 1,500 acres of this alfalfa soil, balance cotton land, sold for \$33.00 per acre.

I know men who have sold bank stock and bought land in the last few months, which is something extraordinary for Mississippi.

Hoping this is the information you desire, I beg to remain,

Respectfully yours,

(Signed)

B. H. STRONG.

The following certificate is one in which every Mississippian should take pride:

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF PLANT INDUSTRY,
WASHINGTON, D. C., July 14, 1908.

This is to certify that I have seen the field of alfalfa sown by B. H. Strong, at West Point, Miss., in March, 1908. The accompanying sample is the largest growth of alfalfa for two months after seeding I have ever seen on a field without fertilizer or other special treatment.

(Signed)

NICHOLAS SCHMITZ,
Alfalfa Expert.

Oct. 9th, 1908, Mr. Strong advised that he expected to send me a bale of alfalfa from the sixth cutting this season for exhibition at the National Corn Exposition to be held at Omaha December 9-19th. It may be true that the soil of Eastern Mississippi is especially adapted to the growing of alfalfa, but it is also true that this crop is being grown successfully in Louisiana and at several points in Central and Western Mississippi.

Mr. J. W. Goode, of St. Louis, writes as follows of his plantation in the Yazoo Mississippi Valley: "Of the 1,500 acres of tillable land I am now preparing to plant about 600 acres in alfalfa and as I now have a few acres which are paying me nearly \$100.00 per acre per annum I think I can see enormous profit in my alfalfa which grows luxuriantly in all parts of the Yazoo Valley."

Mr. Goode should have qualified this assertion by saying that alfalfa will grow luxuriantly in the Yazoo-Mississippi Valley on lands that are thoroughly drained and under the most intelligent and careful cultivation.

In the Kentwood, Louisiana, Courier, of Oct. 30th appeared an article signed "farmer", in which the following statement was made concerning Tangipahoa Parish: "We have a population of about thirty thousand people in this parish; 29,500 buy their meat, and the other 500 raise enough to last them about three or four months of the year. The 29,500 buy it from the North and West, and yet Col. Chas. Schuler, a practical, up-to-date farmer and Commissioner of Agriculture for Louisiana, in a public address, made the following declaration: 'Hog raising can be successfully followed in Louisiana, and has been a success on my farm for thirty-two years. The common expression "that you must have a hog that can out run a nigger," is all stuff and nonsense. I cultivate about 800 acres, use altogether negro labor, and cannot remember ever having a pig or hog stolen. I raise hogs in connection with my main money crop—**cotton**. I usually kill from fifty to seventy-five head each year, averaging from 150 to 200 pounds net per head. I kill on the farm and sell surplus to merchants and customers in the city. I have kept dry salt meat (sides) from hogs killed in December perfectly sweet and good until the latter part of May; have kept and exhibited at country fairs hams that were eighteen months old after killing, perfectly sound and sweet. The fact is that the Louisiana hams, as cured by me, have a reputation for good quality equal to any ham made in this country. I claim that by adopting my methods, and charging the hog up with only the labor of producing the food, letting him do his own harvesting, that gross pork can be raised in this climate at not much over one-half cent per pound."

If the boll weevil advent into Louisiana and Mississippi drives your farmers to hog raising, which is a profitable industry in Iowa, where the cost of production is at least six times the amount quoted by Col. Schuler, then instead of lying awake nights to think up swear words you can hurl against Mr. Weevil, you should be planning for a monument to commemorate his coming.

The corn crop of the United States for 1907 was estimated at 2,707,000,000 bushels, of which Mississippi produces 42,500,000. The suggestion that Mississippi can not compete with the Western states in the growing of corn is worthy of careful analysis. Last year Holmes county, Mississippi, through the able and persistent efforts of Prof. W. H. Smith, County Superintendent of Education, a Boys' Corn Club

was organized with a membership of 250, each striving to produce the greatest yield of corn. The average yield in Mississippi last year was 17 bushels per acre; but these boys who have been instructed how to prepare the soil, had been furnished well tested seed corn and advised how and when to plant and cultivate, had the satisfaction of showing, as a result of their experiments, from 75 to 120 bushels per acre. Do I hear some one say these conditions are extraordinary. Ah! yes, they were extraordinary! These boys put their heads in the game. They proved beyond a question what I am contending for: that the soil and climate and rainfall and long season of Mississippi give her a positive advantage over the short season of the so-called corn growing states of the North and West. Would you farmers go into winter with your barns and cribs filled with corn? Follow the plain, easy, but scientific methods of those boys. Possibly some one living in the hill country and familiar with the fact that Holmes county has a large percentage of bottom lands, will insist that such yields of corn could not possibly have been produced on any other than the alluvial bottom lands of the state. Fortunately, I have several letters from gentlemen located in the so-called but mis-named "hill country" of Mississippi. Let me read a few of them. The first is from Hermanville, Mississippi, our near neighbor on the north.

HERMANVILLE, MISS., July 18, 1908.

CAPT. J. F. MERRY,
Manchester, Iowa.

DEAR SIR:—It affords me much pleasure to give you such information as I may possess in regard to corn growing in my section of the State. I think there is no doubt but what a reasonably good crop of corn can be grown each year with the proper preparation of the soil and cultivation of the crop, and of course proper seed selected.

My method of preparation of the land this season was as follows: I first broke the land flat, 8 inches deep, with a No. 90 two-horse Oliver chilled plow early in March, and then doubled disced same both ways, and laid rows off four feet and planting in this furrow about March 10th, and cultivating every ten days thereafter with a Planet Jr. cultivator, shallow, laying by about the first of June, using carefully selected seed of native variety (that is, corn bred in the county for some time). This corn will average fifty bushels per acre this year on clay hills without fertilizer. If at any time I can be of service to you, command me.

Thanking you for the interest you are taking in Mississippi, I am
Very truly,

(Signed)

W. A. FIFE.

The second and third letters are from Madison County, that claims the distinction of having located within its borders, more Northern farmers than any other County in the State.

RIDGELAND, MISS., Oct. 17, 1908.

CAPT. J. F. MERRY,
Manchester, Iowa.

DEAR SIR:—Referring to some corn which I sent you from my place here near Ridgeland for exhibition in your car on a recent trip you made through Illinois, and which seems to have elicited some very favorable comment from Illinois farmers who visited your car, I beg to advise this corn was raised by a negro "share cropper" on my place, who is far from being a wide-awake and up-to-date farmer, but like most negroes, is more anxious to "lay by" his crop than to give sufficient cultivation. In spite of this, however, we managed to make a very fair out-turn, using no fertilizer. The crop is still in the shock and, therefore, I am unable to give accurate figures as to the yield; but I am confident he has made over 65 bushels to the acre—perhaps possibly 75 bushels.

I planted two varieties, namely, Snowflake and Tennessee Red Cob, both of which did well. It seems to me that if a negro, with his characteristic lack of energy and intelligent cultivation can make an out-turn like this, well directed efforts by thrifty Northern farmers ought to work out some remarkable yields in the brown loam soil, which is so susceptible to proper cultivation, and responds so kindly.

There are some failures made here, of course, and in cases where new-comers are from districts where soil treatment is entirely different, but I have never seen failure with our soil where intelligence and energy combined were applied.

(Signed)

Sincerely,

W. C. SMITH.

RIDGELAND, MISS., Oct. 17, 1908.

CAPT. J. F. MERRY,
Manchester, Iowa.

DEAR SIR:—I came here from Kane County, Illinois, about ten years ago, and have grown corn, cotton, and truck crops ever since. I have practiced growing corn each year after taking off some other early crop. In this method of corn growing I get two good crops each year and the first crop usually makes more money for me than the crop of corn.

I plant corn about June 15th in drills 3 1-2 to 4 feet wide, thin to one stalk eighteen to twenty inches in row; shallow cultivate five to six times, use no fertilizer, and get an average yield of forty-five bushels per acre. By fertilizing or manuring and cultivating as often as needed, I can get a yield of about 60 bushels per acre.

I plant Mosby's Prolific and Improved June or Jones's Prolific. I am positive with my experience that a man can raise as much corn to the acre here on hill land as he can anywhere in Illinois in the Corn Belt, by scientific methods.

But few of our farmers are scientific. Madison county needs more practical Northern farmers, and while we have more of them in the brown loam district than in any other county in the State, there is a large area of farm lands here that can be bought, that are well located, at prices ranging from \$10.00 to \$25.00 per acre. I will say this much for Madison County: I can turn off more money on forty acres here on land that cost me about \$25.00 per acre, than my brother can on his 160 acre Kane County, Illinois farm, and he is considered a good farmer. His land is worth \$150.00 per acre.

There is a good chance for a poor man to get a home here if he will apply himself. Send your farmers down to Ridgeland; we will treat them well and show them what we are doing.

Very truly yours,

(Signed)

RAS THOMPSON.

The fourth and last letter is from a gentleman at Port Gibson whom some of you, doubtless, know:

PORT GIBSON, MISS., Aug. 25, 1908.

MR. J. F. MERRY,
General Immigration Agent,
Manchester, Iowa.

DEAR SIR:—Answering your inquiry as to how I raise 75 bushels and over of corn to the acre in this section, I would say I find it easy and about as follows: This is the "hill country" and my land is red clay. I break up the ground about six or eight inches deep in early fall or winter. This is to prevent the ground washing and to stow moisture. Early in spring I plow shallow turning under any winter or cover crop I may have on land. I plant the best seed corn I can get, as I believe the best is none too good. I cultivate and lay by with Planet Jr. cultivator, sowing Whippoorwill peas in middles at last working. I use from twenty-five to thirty loads of stable manure to the acre, when I can get it, often I can not get as much.

No matter what the season, I have made good crops of corn for several years. Last season I made over 75 bushels per acre and this season I shall make at least 75 bushels per acre. The ground has steadily improved and my interest and pleasure in the work has likewise increased. I shall try next season for 100 bushels per acre.

Very truly,

(Signed)

J. M. TAYLOR.

The four gentlemen whose letters I have read are total strangers to me, but I have no reason to question their frank and interesting statements. Before leaving the corn phase of this question, which I regard as very important and furnishing a means of thwarting the base design of the boll weevil, let me quote again from a letter received from Prof. Smith, to whom we are indebted for introducing Boys' Corn Clubs into the State of Mississippi. He says: "I was impressed with the fact that Holmes County, as well as other sections of Mississippi, has

unlimited resources as yet undeveloped; that our fields are not producing the wealth that could be brought out through a better system of cultivation and soil improvement. It has been demonstrated that our soil is capable of producing 100 bushels of corn to the acre or more, yet our average production is not 20 bushels per acre. Our land can be made to yield from one to two bales of cotton to the acre, still we make only a bale to three acres. Our country is full of possibilities. The soil is capable of producing, under our genial climate, a wonderful variety of paying crops. One man will exhibit at the State Fair this fall 127 different products from one farm. We have the best pasture and corn land, but we are bringing our horses and meat from the West.

"With these considerations you will readily see that I believe in the resources of this country, and what we most need now is to bring our people to realize that there is a bright future for agricultural Mississippi, if we can put the proper amount of skill and intelligence into the soil. So with these facts as a basis here are some definite purposes of the Corn Club work:

"1. To aid through actual experiments, the State Agricultural College in reaching the masses of the people with its work.

"2. To make farm life more attractive and farming more profitable.

"3. To make the study of agriculture in the schools practical and interesting.

"4. To make the rural environments of the child minister to his education.

"5. To enable the people to take better advantage of the public schools by making them more prosperous.

"6. To encourage soil study, soil improvement, better cultivation, seed selection, etc."

Prof. Smith, in the promulgation of this kind of gospel, is unconsciously doing his state great service. The average production of corn in Illinois last year was 36 bushels; in Iowa, 29.5 bushels; in Mississippi, 17 bushels, and in Louisiana, 17.5 bushels. Farmers of Mississippi, you should insist that your tenants and your farm help shall give the same attention to the growing of corn in 1909 that they have in past years to the growing of cotton. If they will do this, you will have from 35 to 50 bushels per acre. Mississippi last year had 2,500,000 acres in corn, which the Department of Agriculture estimated at 75c per bushel, amounting to \$31,875,000.00; Illinois had 521,000 acres in corn, estimated at 44c per bushel, amounting to \$150,813,000.00; Iowa had last year 9,160,000 acres in corn, valued at 43c per bushel, amounting to \$116,195,000.00, and Louisiana had 1,600,000 acres in corn,

valued at 70c per bushel, amounting to \$19,600,000.00. If you would get the start of the boll weevil, increase your acreage in corn 50%, and if you would make more net money in 1909 than you have averaged for the past twenty years, it can easily be done by a thorough preparation of your cotton and corn ground, planting only seed that has been carefully tested, and cultivating it in the best possible manner. I am a friend to cotton, and not at all alarmed about the boll weevil, but I must insist that other than cotton crops in Mississippi and Louisiana are possible. To secure the best results, we must fertilize retake, and diversify.

Poultry is another industry in which the farmers of the South should engage. The United States report shows that in 1905, Iowa produced poultry to the amount of \$31,250,071.50; Illinois, \$29,522,408.70, while Mississippi had to her credit on poultry account only \$7,713,758.08, and Louisiana but \$4,612,331.55. In an investigation of the poultry business along the Southern division of the Illinois Central System, I addressed a letter to Mr. T. S. Scanlan, Manager of a large poultry farm at Hammond, La., to which he replied as follows:

"We have incubator capacity for 15,000 eggs, and are installing a large machine with a capacity of 150,000, with brooder house sufficient for the out-put. In all, we have 35,000 square feet of floor space in our buildings and under construction.

"We breed exhibition, utility and fancy market poultry, also supply guaranteed fresh eggs. The breeding stock we now have consists of 5,000 chickens, 3,000 ducks, 150 geese and 1,200 pigeons, consisting of the following breeds: Barred, Buff and White Plymouth Rocks, White and Columbia Wyandottes, Rhode Island Reds, Buff Cochins, Light and Dark Brahmas, S. C. Black Minorcas, B. B. Red Game and Buff Cochin Bantams, Toulouse Geese, Pekin Ducks, Homer Pigeons, and Bronze Turkeys.

"The climate here is admirably adapted to the poultry business. The cost of building is much less than in the North, and we find open houses preferable. While we are somewhat troubled with the roup and canker, the disease most prevalent among the poultry is sore-head. We find a ready market for all the poultry that we can raise, and at a good price. Our best season comes at a time when the markets in the North are the highest, and it affords us an opportunity to dispose of all our market poultry and eggs at a good price.

"We feel assured of the future success of the farm, and contemplate many more improvements, in order to be in a position to supply

the ever increasing demand for poultry and eggs as well as exhibition stock.

"Should you wish any other information in regard to the poultry business in this section, we shall be pleased to hear from you."

Mr. Scanlon is authority on poultry raising in Louisiana, which is certainly equally applicable to Mississippi. With shipping facilities to Northern markets, such as are afforded by the Yazoo and Mississippi Valley and the Illinois Central Railroads, every farmer in Mississippi and Louisiana should utilize the speckled hen in making her pay the taxes and table expenses of the family.

Thirty years ago not a peck of vegetables was shipped from Louisiana and Mississippi to Northern markets. This season Crystal Springs shipped from that one station no less than 1,054 car loads of vegetables, 660 of which were tomatoes. I have not a report of the results of this season's crop, but I give you this report of last year, when the shipments amounted to but 818 car loads:

CRYSTAL SPRINGS, MISS., Oct. 9, 1907.

MR. J. F. MERRY,
General Immigration Agent,
Manchester, Iowa.

DEAR SIR:—Yours received, and in reply take pleasure in stating that Crystal Springs shipped from about three thousand acres the following number of cars of vegetables for the season of 1907:

(CARS)		
VEGETABLES.	NUMBER.	NET RETURNS.
Tomatoes	432	\$ 297,386.69
Cabbage	249	131,139.29
Beans	60	38,274.00
Carrots	45	17,010.40
Turnips	16	4,111.00
Peas	10	5,955.00
Beets	5	1,286.00
Radishes	1	310.40
Total	818	\$495,475.28

An average of \$165.15 per acre. It was the best cabbage year we ever had. About an average for the other crops. Our crops of cotton and corn, as second crops after vegetables, were the best in the history of the business. Farmers in this section are in a better shape than at any time since before the war.

No grower has made any test of the onion crop in this section.

Hoping the above will answer your purpose, I remain,

Yours very truly,

(Signed)

R. E. LOTT, Secretary.

These figures speak for themselves, and in no uncertain language. It is crop diversification in its best sense. The vegetable trade of the South is as yet in its infancy, and the experience of the Crystal Springs country shows that the substitution of the trucking industry for that of cotton will not be disadvantageous. In 1880 the soil about Crystal Springs had become so worn that out it would scarcely grow a quarter of a bale of cotton to the acre. It is said that the farmers in that vicinity actually abandoned their farms and moved to Texas; but I am pleased to state that many of them have returned, and today Crystal Springs is the shipping point of one of the most prosperous communities, not only in the South, but in the United States; and if there is a happier or more intelligent community in this, or any other, country, I do not know where it is located. Mark you, my friends, this wonderful prosperity is the legitimate result of a diversification of crops.

From three points in Copiah county the shipments of vegetables this season aggregated more than 2,000 car loads. The boll weevil has no terror for the vegetable grower. Ponchatculla, Hammond, and Roseland, Louisiana, are large shippers of vegetables. Last year a gentleman at Roseland, La., formerly of Kalamazoo., Mich., and one of the most intelligent and successful growers in the United States, sold his 4.32 acres of cabbage for \$4,600.00 gross, deducting all expenses he had \$2,200.00 net profit from less than five acres of cabbage. This is a remarkable showing which can not be duplicated, except when cabbages are scarce and the price is very high. Cabbage is a fickle crop and for a farmer to confine himself to the growing of cabbages exclusively is even more unbusiness-like than to grow cotton to the exclusion of all other crops. The early cabbage for 1908 was unprofitable, but according to the "Inland Farmer", published at Louisville, Kentucky, the late crop is so short in the United States and prices are now so high, that cabbage will be imported from Holland and Denmark to supply the demands for that staple article of diet to be found on American as well as German tables.

The growing of Irish potatoes, both for local and Northern markets, is an industry in which the farmers of Mississippi and Louisiana may engage with a reasonable expectation of fair returns. Already one of the enterprising firms of this city is shipping Irish potatoes in car load lots and encouraging the farmers of this territory to cultivate a much larger acreage than heretofore. It is said that the boll weevil is responsible for the thousands of acres of onions that are now being profitably grown in Texas, where, a few years ago, cotton was the exclusive money crop. I am in receipt of letters from gentlemen located

in Mississippi and Louisiana, who claim that although no effort has been made to grow onions in this territory, for commercial purposes, yet they are grown on every farm for table use, and that, on account of your superior facilities, you can easily compete with Texas in the growing of the product.

On the 28th of last April I received a letter from Mr. A. M. Middleton, from Canton, Miss., who was born and raised only seven miles from where I live in Iowa. Let me quote from this letter, simply to show what the supposedly worn-out lands of Mississippi will produce under proper cultivation: "I came to Madison County four years ago; bought a four-hundred-acre plantation 4 1-2 miles south of Canton, which was so poor that one tenant had been renting the entire tract, or such part of it as he cared to work, for \$50.00 per year. I immediately started a gang plow with six good horses to it, setting the plow as deep as it would go. I now have 400 acres under the plow; am raising cotton, corn, oats, cow peas, etc., and have five acres in peaches. I am also raising mules, as this, to my mind, is an ideal country for stock raising. I want to tell you what I did on one 40 acre tract last year. It had been cropped in cotton for 70 years—everything taken off, and nothing put back. I plowed it deep, sowed it to winter oats in December, 1906; in June, 1907, I harvested and threshed from this 40 acres, 1,200 bushels of oats, which I sold for 75c per bushel. I then plowed and sowed this same 40 acres to cow peas and harvested and threshed 150 bushels of peas, which I sold for \$2.50 per bushel, and I sold the peavine hay for \$15.00 per ton."

"You figure this up, and see how it will compare with what you grow on Iowa and Illinois land worth from \$100.00 to \$200.00 per acre. We now have three J. I. Case threshing machines in Madison County."

Before leaving home, I learned from his father that Arthur would sow 250 acres in oats next month. It will be a sure revelation to Mississippians, but why not sow oats? a crop that is always in demand in Mississippi at good prices. He but shows good judgment, and his farm will be an object lesson, showing one way in which to get the start of the boll weevil in 1909.

Strawberries are grown successfully throughout Mississippi and Louisiana. Some years they are very profitable, and others they simply furnish the choicest luxury for the table, and possibly enough money to pay the expense of care and picking. Every farmer in the two states mentioned can, and should, have a small strawberry patch.

In a single address it is impossible to even touch upon the various crops that can be grown successfully and profitably on Mississippi and Louisiana soil. I have introduced letters over the signatures of men

who live, and own and operate farms in your State. They state, in the most positive terms, what they are actually doing this year in the cultivation of a variety of products. These products are grown in practically the same kind of soil as that in which you are growing cotton. Their crops are issued by the same sun and watered by the same kindly rains; and what they have done as a result of diversifying their crops, you can certainly do. And if you farmers and planters of Mississippi permit the boll weevil to place mortgages upon your farms, to tax your credit at the bank, to rob your tables of their accustomed luxuries, and, perhaps, deny your family the bare necessities of life, it will not be because you are settled in a country where only one crop can be grown. No, my friends, there is nothing discouraging in the outlook if you will but get the consent of your better judgment and begin now to diversify your crops. You have in this territory scores of farms that could, in two years, be made to double their earnings in spite of the boll weevil, or any other pest, simply by changing your methods. Let me suggest also that with a few dollars judiciously expended in improving your buildings, and making your farm environments more attractive, the selling value of many of your farms would be more than doubled, and what is better than all this, I believe, would result in what your farmers desire above everything else—the keeping of your boys on the farm.

Secretary of Agriculture Wilson is an Iowa man, and one whom we all greatly love and respect. He says of the United States: "We are becoming a Nation of meat-eaters, eating more meat than ever before, while the farmers are not raising as much as formerly. This is why meat is so much higher than ever before; and it is going higher."

These words, coming from so high an authority, should stimulate every farmer to pay more attention to the raising of cattle and hogs. We want, if possible, to get out of the old ruts; not because we do not like them, but because they do not pay. We want the farmers of Mississippi and Louisiana to so rotate and diversify, and cultivate their crops, that each farmer may have a bank account, every boy a horse and carriage of his own, dedicated to the exclusive use of himself and his "best girl." We want the girls to have a piano and a parlor in which to put it, where she can invite and entertain her "best fellow." We want the South to become noted for her splendid homes, her fine horses, her comfortable barns and sheds, in which every animal on the place is protected from the storm; her fences and fields so cared for, that every passer-by will note the attractive and prosperous conditions of the new Southland.

In this enthusiastic plea for diversification crops, do not think for a moment I would have you abandon the raising of cotton. If you

have a field that has been pastured, fertilized, or cropped in legumes, until you are sure it will produce from one-half a bale to a bale of cotton per acre, you are fully justified in planting it early to cotton and take your chances with the boll weevil; but do not continue this year after year, until the productive qualities of the soil have become exhausted. Rotate your crops, no matter what the price of cotton may be.

One of the sad features in connection with the development of the Southern States since the Civil War, has been the exodus of her own people to other States. It is but natural that a few of the sons and daughters of the South should have emigrated; but I cannot understand why 200,000 Mississippians, and, perhaps, as many Louisianans, should have become citizens of other States. Certainly none of the Western and Southwestern States have the slightest advantage over Mississippi and Louisiana in the matter of climate; it is not because they furnish better and purer water than that which flows from your splendid artesian wells; it is not because they afford better local markets, for where among all the progressive States of the Union can be found four commercial centers that in their growth and commercial development excel the splendid cities of Memphis, New Orleans, Chicago, and St. Louis; it is not because they furnish better transportation facilities than Mississippi and Louisiana, for nowhere can be found better transportation accommodations than is furnished by the railroads, rivers and lakes of this particular section.

You will pardon what seems to be an immodest and selfish reference to the equipment furnished by the Illinois Central Railroad Company for the transportation of Louisiana-Mississippi perishable farm products direct to the principal markets of the East and North. This Company, as far back as 1880, saw the future diversified possibilities of these two Southern States, and, long before it was profitable, put into service its own refrigerator cars that now number over 4,000, and in order that these cars loaded with valuable perishable product, might reach Chicago, St. Louis, Omaha, Sioux City, St. Paul, and other Northern markets, with their cargoes in the best possible condition, it has constructed at convenient intervals between New Orleans and Chicago, no less than five icing stations, from which, with no expense to the shippers, these cars are re-iced as occasion may demand.

Leaving Mississippi and Louisiana for California or any other section of the United States, is not because your educational institutions have failed to keep pace with other States—North, South, East, or West; it is not because, in the onward march of civilization, you have fallen behind other States in the development of good morals and pure religion; nor is it conceivable that any family should have left these States with

the hope of finding a better citizenship, or a more hospitable people among whom to make a permanent home.

To what, then, may we attribute this great exodus that has been going on for more than forty years? It cannot be because the soil of Mississippi and Louisiana, as already shown, fails under proper cultivation to bring forth abundantly and profitably as great a variety of farm products as can be found in a like area in any section of this the greatest agricultural country on the globe; nor can it be because of the high prices of your fertile lands, for even now there are 150% to 200% less than the same quality of lands 500 miles to the North. I cannot speak authoritatively, but I am persuaded, Mr. Chairman, that a large percentage of this emigration, principally of your young men, from your splendid State, has been from the rural sections; and that one of the reasons for this may be found in the fact that your system of farming in the past, and possibly at present, is in some degree faulty. Your net profits have been too small, and your farm environments too unattractive; and because of this the boys no sooner attain their majority than they seek other fields that promise better net results. The doctor does not always correctly diagnose his case, and I may be wrong in assuming that the going out of so much brawn and brains from Mississippi and Louisiana has been, and is now, due to agricultural conditions that may be improved. In the discussion of this question I not only want to urge diversification, but I would like, if possible, to convince the citizens of Mississippi and Louisiana that no matter how flowery may be the descriptions of other sections of our common country, none of them excel these two Southern States in everything that may make farm life desirable. I want, if possible, to convince this audience, many of whom, I trust, are farmers, that a careful study of the climate and natural conditions of this section develops the fact that the fields of Mississippi and Louisiana respond to every honest effort of plow and hoe, and should not, therefore, be robbed of their fertility from year to year, and from producing a variety of products to which they are adapted and from which there is a constant and increasing demand at remunerative prices. Let us, therefore, exonerate the soil, exonerate the climate, exonerate the water supply, the educational, religious, and social conditions from any blame in connection with this not imaginary but unfortunate and greatly to be deplored fact: that Mississippi and Louisiana have in the past populated many Western States with their splendid citizens, whom they could ill afford to spare.

And now, Mr. Chairman, lest some of the good people present may think it wholly unwarranted that a railroad man from Iowa should presume to offer any suggestions to the farmers of Mississippi and Louisiana,

I want to say that while it is true that I have been connected with the Illinois Central Railroad Company for 28 years, yet I was born and raised on a farm, and am now the happy owner of a small farm of 280 acres, stocked with Holstein cows, Duroc Jersey hogs, brood mares, and Plymouth Rock chickens, and as the place is located only three and one-half miles from Manchester, Iowa, which has been my home since 1865, there is not a week, nor scarcely a day during the summer season, when at home, that I do not visit the farm and consult with the tenant not only as to what will bring us the most money, but what is best for the farm, how its productiveness may be increased, what will make the least work for the tenant's wife, and what can be done to make the work and all the environments, such as will stimulate the children to love instead of hate the farm.

Farming has, indeed, become a great industry throughout the United States. The Department of Agriculture is responsible for a recent statement in which is shown the increased value of farm products in the United States for the past four years; they are as follows:

In 1905 it was.....	\$6,415,000,000
In 1906 it was.....	\$6,794,000,000
In 1907 it was.....	\$7,412,000,000
In 1908 it was.....	\$8,200,000,000

Surely the farmer has no reason to complain; and yet I wonder how many tillers of this soil in the audience have ever asked themselves the question: "Why am I a farmer?" Your answers may have been about as follows:

1. I do not know enough to be anything else.
2. I am a farmer by inheritance, and I hate it.
3. It is an easy way to get a living.
4. Because I like it and can make money at it.

The first answer is a reflection upon the good common sense of the man who made it; and yet it is a common answer to the question. My friend, if you are farming because you do not know enough to do anything else, you have little heart in the business. You are satisfied to rent out your lands as best you can, allowing the tenant to grow just what he pleases; and he always pleases to grow cotton, to the exclusion of everything else. Some years you do fairly well. You make half a bale of cotton per acre, and you get possibly ten cents per pound for same; but your crop is just a little poorer than it was before the crop was grown. Then comes a poor year, and you have barely enough to live upon. You say to the faithful wife, "We will have to make

the old stove do another year;" and the proposed visit to mother, perhaps not 100 miles away, you will have to postpone. You say to the boys, we cannot have the new buggy, or a new harness, or some new and greatly needed implement on the farm, and the boy who "early gets his head into the game," says to himself, "When I get a little older I will emigrate to a country where people do not confine themselves to one crop and where they can make more than a bare living on the farm." This is exactly what they have been doing throughout Mississippi and Louisiana for the past forty years. Can you blame them? No! But who was at fault? The farmer who made himself believe that it required no brains to farm. He is one of the agencies that is driving the young men from Mississippi and Louisiana when he might by the exercise of his intelligence have been growing a diversity of crops, that would have furnished a net income, even though the boll weevil had destroyed every cotton boll weevil on the place.

The second answer to the question: "I am a farmer by inheritance." Do you know, my friends, that the greatest sin is that of ingratitude, and that when a farm, or anything else, has been handed down to us it should be our pleasure as well as our duty to see that it is transmitted to our descendants in at least as good a condition as when it came to us? Have we any of this kind of farmers in Mississippi and Louisiana? Are your buildings painted and kept in repair? Do you read a strong agricultural paper every week? Have you a thoroughbred sire at the head of your stock herd? Are you careful to test your seed corn and seed cotton in the spring so as to know before planting about what percentage of a crop to expect? Do you see that the boys are respectfully clad and furnished with at least one of the popular magazines that now cost only \$1.00 per year? Do you experiment with a variety of crops which interest the boys, to see what can be grown with the greatest profit? If not, you are another recruiting officer for some section other than Mississippi and Louisiana, and if, as you say, you hate farming, my advice is to dispose of the farm as soon as you can to some man who knows the value of Mississippi and Louisiana lands.

The third answer: "It is an easy way to get a living." Well, I hope Mississippi and Louisiana have few such farmers. The man who is looking for something easy generally finds it. He is not worried in the slightest if the gate is off the hinges; if the hogs occupy a rail pen enclosure rather than a comfortable though inexpensive hog-house, he is satisfied. He is the kind of a farmer who thinks the trees plenty good enough for the chickens to roost in. It matters little to him whether the cows are milked at six A. M. and turned to pasture, or eight, nine, or ten o'clock. He regards cotton as the only easy money

crop. He thinks old dishes and worn-out furniture in the house will answer Mother's purpose. He tells the boys he has little use for the new-fangled notions about farming; that he does not believe any of the statements made by truck farmers, and that the good old easy way of working cotton and corn with one mule and a negro between the plow handles is good enough for him. Ah! he forgets that the boy has already visited a neighbor's farm, where the crops are diversified, where they grow a bale of cotton per acre, where the boys have a good horse and buggy they can call their own, where the farm house has many modern conveniences, the stock properly sheltered and some one tell him, "This is the way they farm in other states." Do you wonder he is but waiting for the day when he can say "good-bye" to the old home, and with ambition for his future that is commendable, he leaves the State of his birth.

The fourth answer: "I am a farmer because I like it and can make money at it?" That has the right ring to it. Let us visit this farmer's home. The house is not large, but it has a comfortable gallery; it is kept painted inside and out, and the sleeping rooms are large and airy; the garden is full of flowers; his barns and sheds are neatly painted where every head of stock may be, and every article of machinery is housed. In yonder pasture is a herd of cows, the milk from which is shipped daily to Natchez, Jackson, Memphis, or New Orleans. The fences are kept in repair; the barnyard fertilizer has been so distributed that the meadows and pastures and fields indicate the soil is every year becoming richer instead of poorer; yonder is an alfalfa field from which four crops have already been cut this season, just a short distance from the house is a strawberry patch of five acres that has furnished work for the children of the neighborhood during the picking season, and has increased the farmer's bank account at least \$500.00; adjacent to the strawberry field is an acre of tomatoes and another of asparagus and still another of beans; and back of the barns is a cotton field formerly pastured by a herd of thirty cows. Look at it! It was planted early. The stalks are now large, vigorous, and covered with bolls. It will certainly yield one bale per acre, and will mature before the boll weevil can reach it. In yonder pasture are several colts that at the age of three will sell at from \$125.00 to \$200.00 each. In another pasture there 100 pigs that have grown almost exclusively upon alfalfa and Bermuda grass; and from the road may be seen a field of fifty acres of splendid corn, such as Mr. Taylor grows so successfully at Port Gibson.

It is now eventide. The men are through with the day's work. The horses and mules have all been fed and turned out to pasture.

Everybody seems happy and every condition favorable. If there should be too much rain, some of the crops might be injured. If a drought, some of them would suffer. But if the rains are frequent, the grass in the pasture will increase the flow of milk; if a drought, the cotton will be all the better for it. Whatever may be the weather, they will have plenty of something to eat, and something to spare. Now listen. The farmer says to his eldest son: "John, do you know neighbor Brown wants to sell his farm? How would you like to own it?"

"I don't know. What is the price?"

"Forty dollars per acre."

"Is not that too much for it?"

"I don't think so. Brown, you know, has always been one of those farmers who persisted in growing nothing but cotton; and, of course, his farm is run down; but we could put some cows and hogs on the place, rotate the crops, put in some clover and alfalfa and soon resuscitate it."

The boy hesitates, and then modestly says:

"Well, Father, I love Mississippi, and I enjoy farming the way you farm; and if you buy the place for me, I will soon try to have it like yours."

Listen! That farmer was a recruiting officer—not for Texas, but for his own native State. He not only kept his boys at home, but his farm is a standing object lesson of what may be done under a system of diversified farming in Mississippi and Louisiana. But I hear some one say, "That is an exaggerated illustration." In this you are mistaken. The two States represented in this Institute have better farms and better farmers' homes than I have described, but I am very free to admit there are far too few of them, and because of this your States have suffered a tremendous drainage upon their population, as already stated.

My friends, we must not only keep the boys at home; but we must continue to urge that our plantations be divided and sub-divided until they can be profitably handled. We must introduce a greater variety of farm crops; we must make more net money than we have been making; and instead of spending it for another farm, we must spend it in making more comfortable and more attractive the home where Mother reigns supreme, and where, amid all the discouragements and vicissitudes of life, the light of love and hope never goes out.

As I have already stated, Mississippi and Louisiana have 40,000,000 acres of splendid land to be developed. It is an immense area, and its settlement, allowing 200 acres to each farm, means an addition to your

population of 200,000 families. Where are these families to come from? If your State press fairly represents the sentiments of your people, you want no more families whose native food is maccaroni and spaghetti, although it has been demonstrated that no nationality can produce so much cotton per acre at so little expence as they. You do not object to a limited number of families who enjoy pretzels and sauerkraut, although you insist that even they shall abandon their habits and customs of the "Faterland." And yet, notwithstanding your prejudice against foreigners, the report of last spring shows that of nearly 1,500 prisoners in the Mississippi penitentiary, only eight of them were foreigners, and not a single Italian among them.

My friends, you can have no controversy with me in any honest attempt to settle up the unoccupied lands of Mississippi and Louisiana with the best families obtainable, and I honor your judgment in wanting more of the horny-handed sons of toil from the North and Northwest; men who have had experience in diversified agriculture; men who know how and when best to sell their crops after they are grown and harvested; men who personally work early and late; who are not ashamed to grow cotton or cane, rice or ramie, corn or cantaloupe, beans or buckwheat, oats or okra, cattle or cucumbers, hogs or hens, cabbage or carrots, mutton or mules, or anything else that promises satisfactory net returns; men who are home builders and want a part in covering Mississippi and Louisiana with splendid farm homes, such as they left in Iowa, Illinois and Indiana.

For years the Illinois Central Railroad Company has been spending thousands of dollars advertising these States, and trying to send you just the kind of people you want. In this it has been successful to a limited extent.

Madison County, Miss., now claims over 500 such families. Tangipohoa Parish, La., has not less than 4,000 and Calcasieu equally as many. In nearly every county in Mississippi and every parish in Louisiana, are now located a few families as a direct and legitimate result of such persistent work. The Natchez Chamber of Commerce struck the key note in recommending small farms and a diversity of crops. I wish their example might be imitated by every business organization in Mississippi and Louisiana.

Mr. Chairman, I have no apology to offer for this long address. The subject is one that should interest every citizen, and especially those of these two commonwealths. The vast area of tillable yet non-productive acreage of land in Mississippi and Louisiana should stir within us a love of State that will find expression in immediate action toward its development.

Let me again repeat: "You must make more money on your farms than in the past. This can certainly be done by an intelligent fertilization, cultivation, diversification and rotation of your crops. The great Mississippi Valley, of which Louisiana is the natural gateway to the sea, is the granary, the corn crib, the packing house, the grand storage, the cotton shed, the sugar warehouse, and the rice store house of the world."

Within a few years the farm products of Mississippi and Louisiana may be loaded into steamers at the docks at Natchez and New Orleans, and without breaking bulk, pass through the Panama Canal to the markets of the Orient. You and I may not live to see it, but the generation to follow will see every foot of land in these two States thoroughly and scientifically drained.

Your public highways, many of which are now next to impassable in winter, will become like city boulevards, as they are in many countries in Europe. The boll weevil that is now ravishing your feelings far more than your fields, will be but a memory; and your fertile fields, now in the market at from \$10.00 to \$25.00 per acre, will be in demand at prices ranging from \$100.00 to \$200.00 per acre, as is the case in Iowa and Illinois today. These desirable conditions will be brought about as I verily believe, because you have a soil and a climate that insures the profitable cultivation of cotton and nearly every variety of food products which the markets of the world must have, because in the future a part of your autumn fields will be golden or green, instead of all white, as in the past; your farmers may not grow a less number of bales, but a less acreage of cotton and more of corn, oats, alfalfa, vegetables and fruits. The present remunerative prices for farm products, with the exception of cotton, have not been equalled in the past forty years, and have present indications, have not as yet reached the high water mark. Indeed there is everything to encourage and nothing to discourage the farmers of this territory.

In conclusion, how I covet the eloquence of a Prentiss, that I might impress upon your minds and hearts these great truths! The mother earth has been generous in the bestowment of her best gifts upon the farmers of Mississippi and Louisiana: that the natural resources and possibilities of these agricultural commonwealths are beyond computation: that your market facilities are all that could be desired, and that it is simply incredible and ludicrous to even suggest that the boll weevil, or any other pest, is going to rob you and your posterity of this goodly heritage.

EXPERIMENTS IN FEEDING BEEF STEERS.

By J. A. McLEAN.

Beefmaking has not received generous attention or consideration from Mississippi farmers largely, perhaps, on account of the facts that they are to a very great extent one crop agriculturists, and because of the baneful effects of the Texas fever tick.

A single crop system of farming is not compatible with beef production but necessity is compelling a diversity of farm procedure and is turning the attention of farmers to cattle growing.

The Texas fever tick has been a great factor in keeping men from stock growing. Many impressions have been freely scattered broadcast regarding the tremendously great damages wrought by the fever tick and the inability to obviate these evils. There is no question but that care has to be exercised in growing cattle south of the tick line. Nevertheless, they are successfully grown throughout all the southern states. Mississippi, Florida and Georgia all have great numbers of excellent dairy cattle that prosper without undue care. Texas, Arkansas and to a lesser extent Mississippi and Alabama grow excellent cattle of the beef breeds. It is not then an impractical thing to grow cattle in tick-infested areas.

The hardships wrought by the Texas fever tick are twofold. Directly they affect the individual. When the ticks become numerous on an animal they deplete its vitality reducing it to an emaciated condition. This difficulty is readily reduced to a minimum by dipping in crude oil or by applying the same by hand. Indirectly the tick prevents the importation of superior purebred stock from non-infested areas without incurring liability of loss. Cattle must be raised in the tick areas, becoming immune while very young, or else pass through a period of inoculation approximating four months. After such inoculation they prosper as native-bred cattle. Inoculation is the only means of overcoming this barrier to the buying of purebred stock. Calves under one year withstand the inoculation to a greater degree than older stock. Under veterinary inspection few

are lost from inoculation. There are, however, quite a number of superior purebred herds now established so that farmers do not have to undergo the expense and risk of inoculation. With these sources of supply and the means of combatting the direct effects of the tick at hand the farmer may readily undertake the growing of cattle.

There are a great many things which favor cattle production in Mississippi. The climate is highly suitable. Barns are not required. There is no weather in all the year so cold as to make cattle uncomfortable if a wind-break and a dry bed are provided. These things are cheaply obtained in a low shed closed on the north and west. For breeding stock not even these are necessities.

In a greater part of the State, since the land is rolling, almost every farmer has a greater or less area which is not cultivatable. On such areas with some slight effort splendid grass stands for summer pasturage are obtained thus rendering valuable otherwise waste eyesores. With waste lands waiting to be clothed in grass, ideal climatic conditions, luxuriant corn crops and the ever-convenient cotton by-products Mississippi should take a foremost place in beef production.

OBJECTS.

The feeding experiments reported in this bulletin were undertaken by the writer in the fall of 1908. They are the beginning of a series of beef production experiments of which others will be carried on in the succeeding years with the purpose of investigating and demonstrating the feasibility of beef production under Mississippi conditions. The objects sought in this instance are (1) The feeding value of cottonseed meal and hulls combined when fed, (a) to two-year old cattle, (b) to one-year old cattle; (2) What amounts are most desirable for daily rations; (3) The profitableness of making beef on meal and hulls.

THE EXPERIMENT.

Two lots of cattle were taken, one consisting of twenty-two head of two-year-old steers and heifers, the other twenty-six head of one-year-old steers and heifers. The stock was all raised on the Experiment Station Farm and was of mixed Hereford, Shorthorn and Angus breeding from crossing of bulls of these breeds on native stock. The two-year-olds were on an average four months past two years old and the yearlings about four months past one year old when started on feed. During the previous summer they ran on pasture and continued there until they were put in the feed lot. On account of the unusually dry fall the pastures were short and the cattle in only ordinary con-

dition. In the two-year-old lot the Hereford steers were de-horned just before going on feed which accounts for their shrinkage during the first period of their feeding. The yearlings of Hereford and Short-horn characters were not dehorned.

They were placed in feed lots of about one acre in extent fenced with woven wire fencing and containing water. There was no shelter of any kind provided. The weather was excellent throughout the feeding period, and the stock at no time suffered to any extent from cold winds or rains.

The cattle were weighed three successive days at the beginning and at the end of the experiment, the average being taken respectively as the initial and the final weights.

FEEDING.

They were fed as much hulls as they would clean up in each lot. The two-year-olds were started on 3 pounds of meal and about 23 pounds of hulls each per day. The meal was increased gradually so that in two weeks time they were eating 5 pounds of meal per head per day and in five weeks from starting they were eating 6 pounds of meal each per day. At this time they were eating about $28\frac{1}{2}$ pounds of hulls per head per day which was the maximum amount of hulls eaten. They were kept on this amount of meal for two weeks, then gradually increasing amounts were fed until in a short time they were eating 7 pounds per head per day, and during the last three weeks of the feeding period they ate 7.73 pounds of meal each per day.

No evil effects were found from such feeding in this lot. One steer, the biggest and heartiest eater in the lot went blind of one eye but at no time was his appetite affected.

There were twenty-six head of yearlings in Lot II. They were started on 2.31 pounds of meal and 15.38 pounds of hulls per head per day (60 pounds of meal and 400 pounds of hulls per day to the lot). The meal was increased so that in eleven days from the beginning they were eating 3.85 pounds of meal and 18.46 pounds of hulls per head per day (100 pounds of meal and 480 pounds of hulls per day to the lot), at which rate they were fed for ten days, then gradually increased so that by December 20 they were eating 5.2 pounds of meal and 20.8 pounds of hulls per head per day (130 pounds of meal and 520 pounds of hulls per day to the lot). From December 28 to January they were fed 5.6 pounds of meal and 20.8 pounds of hulls per head per day (140 pounds of meal and 520 pounds of hulls per day to the lot). During the last ten days of the feeding they consumed 6 pounds of meal and 20 pounds of hulls per head per day.

In this lot during the last few days deleterious influences began to show themselves as a result of such heavy feeding. Heifer 139, which lost during January 20 pounds, was most markedly affected. She staggered about when driven and was dull and heavy about the eyes though no inflammation was apparent there as in the case of the steer in the older lot. Two others, 141 and 138, were also affected similarly but not so markedly.

The feeding was done by two students from the Senior class under the direct control of the writer. They were fed at 6 A. M. and 5 P. M. very regularly. Before each feeding the troughs were examined and the condition of the steers observed. Water was always obtainable and the stock drank copiously.

The meal and hulls were of excellent quality. They were obtained locally, the meal costing \$23.50 per ton and the hulls \$5.00 per ton.

LOT I—Two Year Olds.

Tag No.	SEX.	BREED.	Weight Oct. 16.	Weight Oct. 25.	Weight Dec. 1.	Weight Jan. 1.	Weight Jan. 14.
100	Steer	Angus	750	771	850	920	932
87	Steer	Angus	870	954	1,034	1,145	1,137
83	Steer	Angus	868	915	882	960	985
84	Steer	Angus	908	954	1,029	1,100	1,098
71	Steer	Angus	925	956	964	1,020	1,017
345	Steer	Angus	857	840	950	990	1,023
77	Steer	Angus	790	800	852	919	919
150	Steer	Hereford ..	1,020	959	1,095	1,150	1,201
340	Steer..	Hereford ..	778	745	835	930	941
577	Steer..	Hereford ..	900	884	1,006	1,110	1,138
619	Steer..	Hereford ..	785	739	863	900	921
453	Steer..	Hereford ..	860	834	962	1,048	1,066
623	Steer..	Hereford ..	653	628	708	780	795
563	Steer..	Hereford ..	980	1,018	1,083	1,164	1,189
80	Heifer	Angus	950	956	1,061	1,135	1,177
94	Heifer	Angus	1,033	1,094	1,218	1,280	1,309
89	Heifer	Angus	860	894	1,002	1,070	1,096
65	Heifer	Angus	860	887	895	953	1,014
569	Heifer	Hereford ..	754	761	860	1,000	987
522	Heifer	Hereford ..	970	978	1,062	1,139	1,150
88	*			918	992	1,068	1,068
620	†			940	1,032	1,098	1,124

* Entered October 30.

TABLE 2—Gains By Periods on Lot I.

Ear Tag.	Oct. 17 to Oct. 24.	Oct. 25 to Nov. 30.	Dec. 1 to Dec. 31.	Jan. 1 to Jan. 13.	TOTAL 89 Days.
100	21	79	70	12	182
87	84	80	111	Loss 8	267
83	47	Loss 33	78	25	117
84	46	75	71	Loss 2	190
71	31	8	56	Loss 3	92
345	Loss 17	110	40	33	166
77	10	52	67	0	129
150	Loss 61	136	55	51	181
340	Loss 33	90	95	11	163
577	Loss 16	122	104	28	238
619	Loss 46	124	37	21	136
453	Loss 26	128	86	18	206
623	Loss 25	80	72	15	142
563	38	65	81	25	209
80	6	105	74	42	227
94	61	124	62	29	276
89	34	108	68	26	236
65	27	8	98	21	154
569	7	99	140	Loss 13	233
522	8	84	77	11	180
88	*	82	76	0	158
620	*	82	66	22	170
Total	196	1,841	1,684	364	4,052
Per He'd	9.8	83.68	76.54	16.55	184.18
Per Day	1.09	2.32	2.47	1.27	2.06

Average gain per steer, 184.18 pounds.

Average gain per steer per day, 2.06 pounds.

* Entered Oct. 30.

TABLE 3—Lot I, Feed Consumed and Cost of Same.

PERIOD.	Meal Lbs.	Hulls Lbs.	Gain per Lot.	Pounds of Feed per pound of Gain.		Cost p'r Lb. Gain. Cts.
				Meal.	Hulls.	
Oct. 17 to 25.....	520	6,540	196	2.65	33.36	11.45
Oct. 25 to Nov. 30 ..	4,058	20,595	1,808	2.24	11.39	5.48
Dec. 1 to Dec. 31	4,673	17,110	1,684	2.77	10.16	5.79
Jan. 1 to Jan. 13	2,210	7,280	364	6.07	12.71	12.13
Total	11,461	51,525	4,052	2.82	12.71	6.49

Meal cost \$23.50 per ton.

Hulls cost \$5.00 per ton.

In Table I is given the sex of the animals and the external breed characters. The animals were weighed October 16 and again on October 25, because on the 16th immediately after weighing those of Hereford character were dehorned and consequently lost in weight. No trouble arose from dehorning and the total gains for the entire feeding trial would indicate that no serious loss resulted.

TABLE 3 a—Gains.

PERIOD.	Per Lot.	Daily Per Lot.	Daily Per Steer.
Oct. 16 to Oct. 24	196	21.77	1.08
Oct. 25 to Nov. 30	1,808	50.22	2.28
Dec. 1 to Dec. 31	1,684	60.80	2.77
Jan. 1 to Jan. 13	364	28.00	1.28
Total	4,052	45.47	2.06

It is seen from Tables 3 and 3a that during the first period the gains were very low and the cost very high. This is due to the temporary setback subsequent upon the dehorning process and is almost entirely recovered in the next period.

The gains during the last two weeks are much less than would be expected and are consequently much more costly than at any other period since the animals were then getting nearly eight pounds of meal per head per day. It is just questionable if such heavy feeding is advisable. The weather was somewhat unfavorable and the greater

exercise produced from the taking of three successive weighings were both factors reducing the weight on January 13. The steers ate as well and seemed to be doing as well as at any other time.

The cost of gains for the entire feeding period on Lot I is very low and, all factors considered, the trial indicates a profitable undertaking.

Weight at Experiment Station on January 13, 23,287

Weight on market.....21,339

Shrink on lot 1,948

Shrink per head..... 88.5

16 steers weighing 15,199 pounds sold at 5.65 per cwt, \$858.80

6 heifers weighing 6,160 pounds sold at 5.25 per cwt., \$322.35

Total proceeds\$1,181.15

Shipping Expenses:

Feed on road \$ 4.00

Freight.....63.00

Yardage 5.25

Hay 5.95

Commission 10.50 88.70

Net proceeds.....\$ 1,092.45

When put into the feed lot these steers weighed 19,235 lbs. The total feed bill for ninety days was \$257.47 and the net proceeds \$1,092.45, so that \$834.98 could have been paid for these cattle and no money lost or gained on the transaction. Their gross weight when put into the feed lot, weighed without shrink, being, 19,235 pounds, allows as the cost price \$4.34 per cwt. Had they cost 4c a pound, there would have been a profit of \$65.58. From the size and age of these steers 4c per pound would have been the very most they were worth and really a higher class of steer can be put into the feed lot for that price. At 3½c per pound the cattle would have cost \$673.23 leaving as a profit \$161.75 or at 3c per pound they would have cost \$577.05, and given a profit of \$257.93. If these steers had been sold as feeders locally instead of going on feed the very best price obtainable for them would have been 3c, which in one way illustrates the profitable feature of feeding.

TABLE 4—Lot II, Yearlings.

Ear Tag.	Breed.	Sex	Weight Oct. 21	Weight Dec. 1	Weight Jan. 1	Weight Feb. 1
91	Angus.....	Female	705	777	850	887
55	Angus.....	Female	605	585		
60	Angus.....	Female	570	675	722	760
58	Angus.....	Female	680	656	700	775
52	Angus.....	Female	700	837	900	941
88	Angus.....	Female	610	788	848	906
461	Angus.....	Female	590	640	670	702
53	Angus.....	Female	600	650	697	730
136	Hereford	Female	695	750	790	826
143	Shorthorn	Female	550	711	749	808
134	Shorthorn	Female	610	782	845	894
131	Shorthorn	Female	520	642	694	720
137	Shorthorn	Female	590	760	797	840
132	Shorthorn	Female	590	750	762	834
139	Hereford	Female	430	536	572	548
141	Hereford	Male	540	652	710	718
61	Shorthorn	Male	540	622	675	697
15	Shorthorn	Male	500	610	637	670
121	Shorthorn	Male	495	600	637	706
138	Shorthorn	Male	540	660	695	733
135	Shorthorn	Male	500	640	700	736
144	Shorthorn	Male	610	707	734	790
482	Hereford	Male	510	582	600	636
133	Hereford	Male	547	592	622	664
59	Angus.....	Male	670	800	825	889
54	Angus.....	Male	655	680	750	797
			15,152	17,684	18,181	19,207

TABLE 5—Gains by Periods on Yearlings, Lot II.

Number.	To Nov. 30	To Dec. 31	To Jan. 31	Total.
91	72	73	37	182
55	Loss 20			Loss 20
60	105	47	38	190
58	24	44	75	143
52	137	63	41	241
88	178	60	58	296
461	50	30	32	112
53	50	47	33	130
136	55	40	36	131
143	161	38	59	258
134	172	63	49	284
131	122	52	26	200
137	170	37	43	250
132	160	12	72	244
139	106	36	Loss 24	118
141	112	58	8	178
61	82	53	22	157
15	110	27	33	170
121	105	37	69	211
138	120	35	38	193
135	140	60	36	236
144	97	27	56	180
482	72	18	36	126
133	45	30	42	117
59	130	25	64	219
54	25	70	47	142
Total	2,580	1,082	1,026	4,688

TABLE 6—Gains on Yearlings, Lot II.

	Per Lot.	Daily Per Lot.	Daily Per Steer.
To Nov. 30	2,580	64.15	2.56
To Dec. 31	1,082	34.90	1.40
To Jan. 31	1,026	33.10	1.32
Whole Period	4,688	45.52	1.82

TABLE 7—Lot II, Feed Consumed.

	Meal.	Hulls.	Cost of Meal.	Cost of Hulls.
Oct. 21 to Nov. 30	3,787	20,615	44.50	51.54
Dec. 1 to Dec. 31	3,699	15,860	43.46	39.65
Jan. 1 to Jan. 31	5,508	16,185	64.72	40.46
Total	12,994	52,660	152.68	131.65

Total cost.....\$284.33.

TABLE 8—Lot II, Pounds of Feed Per Pound of Gain, Cost, etc.

Period.	Meal.	Hulls.	Cost Per Pound of Gain.
October 21 to November 30	1.47	7.91	3.7 cts.
December 1 to December 31	3.42	14.66	7.68 cts.
January 1 to January 31	5.37	17.77	10.23 cts.
Entire period	2.78	11.24	6.06 cts.

No. 55 was not in good physical condition when the experiment began. She continued for some time without any appreciable change, then began to get more sluggish so that she had to be removed from the lot entirely on November 17. During the time she was in the lot she lost 20 pounds which with the feed she consumed is charged up against the lot.

From a study of the preceding tables it is seen that these young things made very good gains in relation to the initial live weights. The average initial live weight was 583 pounds and the average daily gain for the entire period, 1.82 pounds. During the first period these steers made very economical gains due no doubt to the increase derived in the fill always occurring where steers are first put upon fattening rations.

It is to be noticed that the daily gains gradually decreased though slightly as the feeding period advanced while the number of pounds of feed required for a pound of gain increased. The marked increase in the cost of a pound gain during January is due undoubtedly to the heavy meal ration fed, it apparently being greater than steers of the age and size of this lot could profitably consume and assimilate. It

appears from a study of the daily rations that from $4\frac{1}{2}$ to 5 pounds of meal per head per day is all that yearling steers can profitably use. The older steers in the former lot made apparently economical use of the heavy rations fed them at least up to $7\frac{1}{2}$ pounds per head per day.

If yearling steers are to be carried on meal until they are in fit market shape, the ration used cannot safely approximate 6 pounds per head per day if the effects produced in this feeding trial are to be taken as an index.

When sent to market these yearlings were only half fat. The tendency of this ration in stock of this age seems to stimulate growth fully as much as the laying on of fat. The price obtained in the market indicates somewhat the degree of fatness. Their condition did not justify their being slaughtered, but they had been carried a customary feeding period.

22 steers net weight, 15,728 lbs. at $4\frac{1}{2}c$	\$707.76
3 heifers, net weight, 1,640 lbs., at $3\frac{1}{2}c$	58.45

\$766.21

Freight	\$67.00	
Yardage	6.50	
Feed	1.70	
Commission	12.00	87.20

Net proceeds \$ 679.01

The original weight without shrink was 15,152. The net proceeds less \$284.33 for feed, leaves \$394.68, or a possible purchase price of \$2.57 per cwt. This young stock was clearly worth a higher price than the margin here allows, or in other words they were fed for the ninety-eight days at a distinct loss.

This trial would indicate that yearlings of such condition and size as these were must be fed longer for profitable results. To do this they must not be fed on a six-pound meal ration but preferably on from four pounds to five pounds per head per day.

One phase of great importance has not so far been mentioned in connection with the feeding of meal and hulls as discussed in this bulletin, the resulting increased fertility of the land. Cottonseed meal is bought in this State and applied directly to the land as a fertilizer. Almost all of the fertilizing value of the meal remains in the excreta of the feeding animals, and if any care be taken, it may be readily conserved and applied to the land. By feeding the meal to

profitable beef animals, the cost of the meal is entirely recovered in the beef animal and a profit beside leaving practically all the fertility of the meal to be scattered upon the farming land as a bonus to the cattle-feeder. This is one of the most important features of cattle feeding in this State and should stimulate the industry.

CONCLUSIONS.

I. Cottonseed meal and hulls when fed to two-year-olds gives excellent daily gains at profit making cost.

II. Yearlings will not finish into market condition in a one-hundred day period on cottonseed meal and hulls.

III. A full ration of meal for two year olds, as indicated by this experiment should not exceed 7.5 pounds per head per day and probably not more than 7 pounds per head per day.

IV. One year old stock cannot economically consume 6 pounds per head per day of meal.

Mississippi Agricultural Experiment Station.

BULLETIN NO. 122.

JULY, 1909.

REPORT OF THE WORK AT THE HOLLY SPRINGS STATION FOR 1908.

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BY C. T. AMES.

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As a rule the crops on the Station farm did well in 1908. A good corn crop was made and vetch grew exceptionally well. The terraces controlled the water very satisfactorily though on steep slopes a sod is necessary to prevent washing. Strawberries again did well, giving net returns of over one hundred dollars an acre. The soil produces berries of excellent quality.

The Station barn was struck by lightning in July. One mule was killed and the barn and contents burned. Though the barn was insured for \$1,000, the Station suffered a loss of at least \$1,000. A new barn was built with the funds received from the insurance company.

Mr. R. S. Nicholls was made foreman in January, 1908.

A cottage for foreman was finished as well as three or four cabins for laborers.

### PLAT WORK WITH FERTILIZERS.

**Fertilizers under Cotton.**—Forty-six 1-20th acre plats, on light upland, were used to test several combinations of fertilizers under cotton. Cook's Improved seed were planted May 8, 1908. Tables 1 and 2 give data obtained.



TABLE I—Fertilizer Test with Cotton, 1908.

| Number Plat<br>Each 1-20 acre. | Kind and Quantity of Fertilizer<br>used per Acre.           | 1st. Picking,<br>September 10th. | 2nd Picking,<br>September 25th. | 3rd Picking,<br>October 12th. | 4th Picking,<br>October 28th. | 5th Picking,<br>December 5th. | TOTAL. | Pounds Seed Cot-<br>ton per Acre. | Value of Cotton<br>at 3c per lb. |
|--------------------------------|-------------------------------------------------------------|----------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|--------|-----------------------------------|----------------------------------|
| 1                              | No Fertilizer .....                                         | 2                                | 7                               | 7                             | 7                             | 5                             | 28     | 560                               | \$16 80                          |
| 2                              | 200 lbs. Cotton Seed Meal .....                             | 7                                | 13                              | 17                            | 9                             | 2½                            | 48½    | 970                               | 28 10                            |
| 3                              | 200 lbs. Acid Phosphate .....                               | 13                               | 24                              | 20                            | 5½                            | 2                             | 64½    | 1290                              | 38 70                            |
| 4                              | 200 lbs. Kainit.....                                        | 3                                | 9                               | 13                            | 9                             | 5                             | 39     | 780                               | 23 40                            |
| 5                              | No Fertilizer .....                                         | 2                                | 7                               | 11                            | 6                             | 3                             | 29     | 580                               | 17 40                            |
| 6                              | 200 lbs. Rock Floats.....                                   | 6                                | 17                              | 14                            | 5½                            | 2                             | 44½    | 890                               | 26 70                            |
| 7                              | 400 lbs. Rock Floats.....                                   | 5                                | 15                              | 18                            | 8                             | 2½                            | 48½    | 970                               | 29 10                            |
| 8                              | 200 lbs. Acid Phosphate .....                               | 8                                | 19                              | 13                            | 5                             | 1½                            | 46½    | 930                               | 27 90                            |
| 9                              | 100 lbs. Cotton-Seed Meal,<br>100 lbs. Acid Phosphate ..... | 11                               | 20                              | 17                            | 7                             | 3                             | 58     | 1160                              | 34 80                            |
| 10                             | 100 lbs. Cotton-Seed Meal .....                             | 9                                | 19                              | 17                            | 9                             | 2                             | 56     | 1120                              | 33 60                            |
|                                | 200 lbs. Rock Floats.....                                   |                                  |                                 |                               |                               |                               |        |                                   |                                  |
| 11                             | No Fertilizer .....                                         | 5                                | 13                              | 10                            | 8                             | 3                             | 39     | 780                               | 23 40                            |
| 12                             | 100 lbs. Cotton-Seed Meal .....                             | 8                                | 16                              | 13                            | 4                             | 2                             | 43     | 860                               | 25 80                            |
|                                | 200 lbs. Acid Phosphate .....                               |                                  |                                 |                               |                               |                               |        |                                   |                                  |
| 13                             | 200 lbs. Acid Phosphate .....                               | 5                                | 15                              | 13                            | 6                             | 2½                            | 41½    | 830                               | 24 90                            |
| 14                             | 400 lbs. Rock Floats.....                                   | 5                                | 13                              | 15                            | 9                             | 4½                            | 46½    | 930                               | 27 90                            |
| 15                             | 200 lbs. Kainit.....                                        | 4                                | 17                              | 17                            | 9                             | 4                             | 51     | 1020                              | 30 60                            |
| 16                             | No Fertilizer .....                                         | 2                                | 12                              | 16                            | 11                            | 5                             | 46     | 920                               | 27 60                            |

TABLE II—Fertilizer Test with Cotton, 1908.

| Number Plat, Each 1-20 Acre. | Kind and Quantity of Fertilizer used per Acre. | 1st Picking, 11th. | 2nd Picking, 25th. | 3rd Picking, 12th. | 4th Picking, 28th. | 5th Picking, 6th. | Total per Plat, 1-20 acre each. | Total Seed Cotton per Acre. | Value of Cotton at 3c per lb. | Number Plat, Each 1-20 acre. | Kind and Quantity of Fertilizer used per Acre.         | 1st Picking, 11th. | 2nd Picking, 25th. | 3rd Picking, 12th. | 4th Picking, 28th. | 5th Picking, 6th. | Total per Plat, 1-20th acre. | Total Seed Cotton per Acre. | Value of Cotton at 3c per lb. |
|------------------------------|------------------------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------|---------------------------------|-----------------------------|-------------------------------|------------------------------|--------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------|------------------------------|-----------------------------|-------------------------------|
| 1                            | No Fertilizer                                  | 4                  | 11                 | 14                 | 8                  | 4                 | 41                              | 820                         | \$24 60                       | 1½                           | No Fertilizer                                          | 1                  | 8                  | 7                  | 7                  | 5                 | 28                           | 560                         | \$16 80                       |
| 2                            | 200 lbs. C-S. Meal                             | 11                 | 19                 | 17                 | 11                 | 4                 | 62                              | 1240                        | 37 20                         | 2½                           | 400 lbs. C-S. Meal                                     | 5                  | 15                 | 14                 | 9                  | 3                 | 46                           | 920                         | 27 60                         |
| 3                            | 200 lbs. Acid Phos.                            | 16                 | 28                 | 19                 | 6                  | 2                 | 71                              | 1420                        | 42 60                         | 3½                           | 400 lbs. Acid Phos.                                    | 11                 | 24                 | 13                 | 4                  | 1½                | 53½                          | 1070                        | 32 10                         |
| 4                            | 200 lbs. Kaimit                                | 4                  | 16                 | 12                 | 8                  | 4                 | 44                              | 890                         | 26 70                         | 4½                           | 400 lbs. Kaimit                                        | 2                  | 14                 | 13                 | 6                  | 4½                | 39½                          | 790                         | 23 70                         |
| 5                            | No Fertilizer                                  | 6                  | 15                 | 10                 | 6                  | 2                 | 39                              | 790                         | 23 70                         | 5½                           | No Fertilizer                                          | 4                  | 10                 | 10                 | 5                  | 3½                | 32½                          | 650                         | 19 50                         |
| 6                            | 100 lbs. C-S. Meal                             | 16                 | 24                 | 15                 | 5                  | 1                 | 62                              | 1240                        | 27 20                         | 6½                           | 200 lbs. C-S. Meal.                                    | 24                 | 30                 | 16                 | 6                  | 1                 | 77                           | 1540                        | 46 20                         |
| 7                            | 100 lbs. Acid Phos.                            | 16                 | 24                 | 15                 | 5                  | 1                 | 62                              | 1240                        | 27 20                         | 6½                           | 200 lbs. Acid Phos.                                    | 24                 | 30                 | 16                 | 6                  | 1                 | 77                           | 1540                        | 46 20                         |
| 8                            | 100 lbs. C-S. Meal                             | 8                  | 14                 | 15                 | 9                  | 4                 | 50                              | 1000                        | 30 00                         | 7½                           | 200 lbs. C-S. Meal.                                    | 9                  | 18                 | 18                 | 10                 | 4                 | 59                           | 1180                        | 35 40                         |
| 9                            | 100 lbs. Kaimit                                | 8                  | 22                 | 16                 | 6                  | 3                 | 55                              | 1100                        | 33 00                         | 8½                           | 200 lbs. Kaimit                                        | 17                 | 32                 | 18                 | 5                  | 1                 | 73                           | 1460                        | 43 80                         |
| 10                           | 120 lbs. Acid Phos.                            | 15                 | 22                 | 16                 | 7                  | 1                 | 61                              | 1230                        | 36 90                         | 9½                           | 240 lbs. Acid Phos., 80 lbs. C-S. Meal, 40 lbs. Kaimit | 23                 | 34                 | 17                 | 4                  | 1½                | 78½                          | 1570                        | 47 10                         |
| 22                           | No Fertilizer                                  | 6                  | 14                 | 11                 | 7                  | 3                 | 41                              | 820                         | 24 60                         | 10½                          | No. Fertilizer                                         | 7                  | 15                 | 12                 | 8                  | 4                 | 46                           | 920                         | 27 60                         |
| 23                           | 150 lbs. C-S. Meal                             | 16                 | 21                 | 13                 | 5                  | 1                 | 56                              | 1120                        | 33 60                         | 22½                          | 300 lbs. C-S. Meal.                                    | 25                 | 34                 | 17                 | 5½                 | 1                 | 82½                          | 1650                        | 49 50                         |
| 24                           | 100 lbs. Acid Phos.                            | 17                 | 23                 | 14                 | 3                  | 2                 | 59                              | 1190                        | 35 70                         | 23½                          | 200 lbs. Acid Phos.                                    | 26                 | 33                 | 16                 | 3                  | 1                 | 79                           | 1580                        | 47 40                         |
| 25                           | 150 lbs. C-S. Meal.                            | 14                 | 23                 | 13                 | 9                  | 1                 | 60                              | 1210                        | 36 30                         | 24½                          | 100 lbs. C-S. Meal, 300 lbs. Acid Phos.                | 20                 | 22                 | 9                  | 2                  | 1                 | 54                           | 1080                        | 32 40                         |
| 30                           | No Fertilizer                                  | 6                  | 17                 | 13                 | 6                  | 3                 | 45                              | 910                         | 27 30                         | 29                           | 133 lbs. C-S. Meal, 133 lbs. Kaimit                    | 19                 | 36                 | 15                 | 4                  | 1½                | 74½                          | 1490                        | 44 70                         |
|                              | 400 lbs. Rock Floats                           | 8                  | 20                 | 15                 | 6                  | 2                 | 51                              | 1020                        | 30 60                         | 30½                          | 800 lbs. Rock Floats                                   | 10                 | 25                 | 20                 | 4                  | 1                 | 60                           | 1200                        | 36 00                         |

**Remarks.**—The growing season was favorable.

Each plat represented in Table No. 2 has been fertilized three years in succession, with the same kind and quantity of fertilizers as shown in table.

Phosphates hasten the maturity of cotton. Acid Phosphate, or Rock Floats (untreated finely ground phosphate rock) alone, have given good results on thin soils. Acid Phosphate, or Rock Floats, alone, have given better results on soils with more organic matter in them.

It appears that Rock Floats alone, or in combination with Cottonseed Meal has given about the same results, pound for pound, as Acid Phosphate.

Cottonseed Meal (Nitrogen) alone has given good results.

The farmers in the brown loam area can use 200 pounds of an equal mixture of High Grade Cottonseed Meal, and Rock Floats, or Acid Phosphate, per acre, with good results, on ordinary uplands. For the better classes of soils one third Cottonseed Meal and two-thirds Phosphate, and from 300 to 400 pounds per acre, will give good results.

#### **Variety Test with Cotton.**

Sixteen varieties were used in this test. Soil, light rolling upland. Fertilizer, 200 pounds of an equal mixture, by weight, of Cottonseed Meal and Acid Phosphate per acre in the drill.

Each variety was planted in one row plats, and then repeated six times, which distributed each variety in the entire plat.

Table 3 gives the data obtained.

TABLE 3—Test of Varieties of Cotton 1908.

|                                   | 1st Picking, Sept. 14th. | 2nd Picking, Sept. 30th. | 3rd Picking, October 14th | 4th Picking, Nov. 3rd. | 5th Picking, Dec. 10th. | Tot'l Seed Cot'n per Plat. | Tot'l Lint Cott'n per Plat. | Per Cent of Lint Cotton. | Length of Staple. | Market Value. | Total Lint Cotton per Acre. | Total Value of Seed and Lint Cotton per Acre. |
|-----------------------------------|--------------------------|--------------------------|---------------------------|------------------------|-------------------------|----------------------------|-----------------------------|--------------------------|-------------------|---------------|-----------------------------|-----------------------------------------------|
| 1. Cleveland Big Boll .....       | 25 44 16                 | 8                        | 2 95 35 36.84             | 1 1-16                 | 9                       | 1-16                       | 350                         | \$36.52                  |                   |               |                             |                                               |
| 2. Excelsior .....                | 20 37 22 13              | 2 94 35 37.23            | 7-8                       | 8                      | 7-8                     | 350                        | 35.78                       |                          |                   |               |                             |                                               |
| 3. Moss' Improved .....           | 17 34 16 12              | 2 81 34 41.97            | 7-8                       | 9                      | 340                     | 34.36                      |                             |                          |                   |               |                             |                                               |
| 4. Bledso's Mortgage Lifter ..... | 11 36 23 10              | 5 85 29 34.11            | 1 1-6                     | 9                      | 290                     | 30.58                      |                             |                          |                   |               |                             |                                               |
| 5. Triumph .....                  | 25 41 14 7               | 1 88 29 32.95            | 1 1-16                    | 8                      | 7-8                     | 290                        | 30.47                       |                          |                   |               |                             |                                               |
| 6. Lewis' Prize .....             | 12 32 19 14              | 5 82 29 35.36            | 1                         | 8                      | 15-16                   | 290                        | 30.15                       |                          |                   |               |                             |                                               |
| 7. New Imperial .....             | 17 40 20 10              | 1 88 28 31.81            | 1                         | 9                      | 280                     | 30.00                      |                             |                          |                   |               |                             |                                               |
| 8. Cook's Improved .....          | 15 34 17 9               | 2 77 29 37.66            | 7-8                       | 9                      | 290                     | 29.94                      |                             |                          |                   |               |                             |                                               |
| 9. Hawkins Ex. Prolific .....     | 17 33 19 9               | 2 80 26 32.50            | 1                         | 8                      | 7-8                     | 260                        | 27.39                       |                          |                   |               |                             |                                               |
| 10. Poor Land Cotton .....        | 9 28 17 17               | 4 75 26 34.66            | 1                         | 8                      | 15-16                   | 260                        | 27.35                       |                          |                   |               |                             |                                               |
| 11. Tool's Improved.....          | 27 35 9 4                | 1 76 25 32.89            | 1 1-16                    | 9                      | 250                     | 26.58                      |                             |                          |                   |               |                             |                                               |
| 12. Kings' Improved .....         | 36 30 8 1½               | ½ 76 24 31.58            | 7-8                       | 8                      | 7-8                     | 240                        | 25.46                       |                          |                   |               |                             |                                               |
| 13. Peterkin .....                | 9 30 15 14               | 4 72 24 33.33            | 1                         | 9                      | 240                     | 25.44                      |                             |                          |                   |               |                             |                                               |
| 14. Mortgage Lifter .....         | 13 32 16 10              | 1 72 22 30.55            | 1                         | 9                      | 220                     | 23.80                      |                             |                          |                   |               |                             |                                               |
| 15. Culpepper .....               | 15 27 15 8               | 2 67 19 28.35            | 1¼                        | 10                     | 190                     | 22.84                      |                             |                          |                   |               |                             |                                               |
| 16. Allen Long Staple .....       | 9 25 17 12               | 2 65 15 23.07            | 1 3-8                     | 10½                    | 150                     | 19.75                      |                             |                          |                   |               |                             |                                               |

**Remarks.**—The following varieties of Cottonseed were secured from the persons who originated them: Cleveland Big Boll, Moss' Improved, Lewis' Prize, Cooks' Improved, Bledso's Mortgage Lifter, and Peterkin. The other varieties not here named, were secured from reliable seed houses in Georgia.

The length of staple and price of lint, was obtained through the kindness of two cotton merchants in Holly Springs.

In total results, seed were estimated at \$16.00 per ton.

The object of this test is to show the differences that exists between varieties, that are worthy of attention.



Every precaution was taken to prevent any conditions affecting results, other than the difference in seed.

**Conclusions.**—The growing of staple cotton on thin uplands, is less profitable than the shorter lint varieties, and should not be attempted.

An early big boll variety has given the best results.

An early big boll type cotton, with a high per cent of lint, will apparently be an important factor in successful cotton production under boll weevil conditions.

### FERTILIZER TEST WITH CORN.

Forty-four plats were used in this test on ordinary valley land. Plats represented in Table No. 4 are 1-20 acre, and were planted on April 8, 1908. Plats planted June 10, in Table 5, were 1-20 acre in size and were duplicated. Mosby was the variety of corn used in both instances.

**TABLE 4—Fertilizer Test with Corn, 1908.**

|    | Kind and Quantity of<br>Fertilizer used per Acre. | Bu. p'r<br>Acre. |     | Kind and Quantity of<br>Fertilizer used per Acre. | Bu. p'r<br>Acre. |
|----|---------------------------------------------------|------------------|-----|---------------------------------------------------|------------------|
| 1  | No Fertilizer .....                               | 23.05            | 11½ | No Fertilizer .....                               | 32.50            |
| 2  | 200 lbs. C-S. Meal .....                          | 33.88            | 2½  | 400 lbs. C-S. Meal .....                          | 59.72            |
| 3  | 200 lbs. Acid Phosphate .....                     | 34.72            | 3½  | 400 lbs. Acid Phosphate .....                     | 55.27            |
| 4  | 200 lbs. Kainit .....                             | 33.61            | 4½  | 400 lbs. Kainit .....                             | 53.61            |
| 5  | 400 lbs. Rock Floats .....                        | 38.33            | 5½  | 800 lbs. Rock Floats.....                         | 67.50            |
| 6  | No Fertilizer .....                               | 41.66            | 6½  | No Fertilizer .....                               | 49.72            |
| 7  | 100 lbs. C-S. Meal .....                          | 45.27            | 7½  | 200 lbs. C-S. Meal .....                          | 57.77            |
|    | 100 lbs. Acid Phosphate .....                     |                  |     | 200 lbs. Acid Phosphate .....                     |                  |
| 8  | 100 lbs. C-S. Meal .....                          | 41.94            | 8½  | 200 lbs. C-S. Meal .....                          | 54.44            |
|    | 100 lbs. Kainit .....                             |                  |     | 200 lbs. Kainit .....                             |                  |
| 9  | 100 lbs. Acid Phosphate .....                     | 38.61            | 9½  | 200 lbs. Acid Phosphate .....                     | 41.94            |
|    | 100 lbs. Kainit .....                             |                  |     | 200 lbs. Kainit .....                             |                  |
| 10 | 120 lbs. Acid Phosphate .....                     | 37.77            | 10½ | 240 lbs. Acid Phosphate .....                     | 44.44            |
|    | 40 lbs. C-S. Meal .....                           |                  |     | 80 lbs. C-S. Meal .....                           |                  |
|    | 40 lbs. Kainit .....                              |                  |     | 80 lbs. Kainit .....                              |                  |
| 22 | No Fertilizer .....                               | 33.61            | 22½ | No Fertilizer .....                               | 36.11            |
| 23 | 150 lbs. Acid Phosphate .....                     | 34.72            | 23½ | 300 lbs. Acid Phosphate .....                     | 32.22            |
|    | 50 lbs. C-S. Meal .....                           |                  |     | 100 lbs. C-S. Meal .....                          |                  |

TABLE 5—Fertilizer Test with Corn 1908.

|    | Kind and Quantity<br>of Fertilizer used on<br>Acre basis. | Bu.<br>per<br>Acre. |     | Kind and Quantity<br>of Fertilizer used on<br>Acre basis. | Bu.<br>per<br>Acre. |
|----|-----------------------------------------------------------|---------------------|-----|-----------------------------------------------------------|---------------------|
| 1  | No Fertilizer .....                                       | 52.63               | 1½  | No Fertilizer .....                                       | 61.66               |
| 2  | 200 lbs. C-S. Meal .....                                  | 66.59               | 2½  | 400 lbs. C-S. Meal .....                                  | 68.88               |
| 3  | 200 lbs. Acid Phosphate .....                             | 64.79               | 3½  | 400 lbs. Acid Phosphate .....                             | 61.03               |
| 4  | 200 lbs. Rock Floats.....                                 | 65.95               | 4½  | 400 lbs. Rock Floats.....                                 | 63.47               |
| 5  | 200 lbs. Kainit .....                                     | 62.84               | 5½  | 400 lbs. Kainit .....                                     | 65.33               |
| 6  | No Fertilizer .....                                       | 57.13               | 6½  | No Fertilizer .....                                       | 56.11               |
| 7  | 100 lbs. C-S. Meal .....                                  | 59.30               | 7½  | 200 lbs. C-S. Meal .....                                  | 58.75               |
|    | 100 lbs. Acid Phosphate .....                             |                     |     | 200 lbs. Acid Phosphate .....                             |                     |
| 8  | 100 lbs. C-S. Meal .....                                  | 60.55               | 8½  | 200 lbs. C-S. Meal .....                                  | 57.08               |
|    | 100 lbs. Kainit .....                                     |                     |     | 200 lbs. Kainit .....                                     |                     |
| 9  | 100 lbs. Acid Phosphate .....                             | 63.05               | 9½  | 200 lbs. Acid Phosphate .....                             | 65.27               |
|    | 100 lbs. Kainit .....                                     |                     |     | 200 lbs. Kainit .....                                     |                     |
| 10 | 120 lbs. Acid Phosphate .....                             | 67.43               | 10½ | 240 lbs. Acid Phosphate .....                             | 59.51               |
|    | 40 lbs. C-S. Meal .....                                   |                     |     | 80 lbs. C-S. Meal .....                                   |                     |
|    | 40 lbs. Kainit .....                                      |                     |     | 80 lbs. Kainit .....                                      |                     |
| 22 | No Fertilizer .....                                       | 63.05               | 22½ | No Fertilizer .....                                       | 60.00               |
| 23 | 150 lbs. C-S. Meal .....                                  | 61.38               | 23½ | 300 lbs. C-S. Meal.....                                   | 56.45               |
|    | 50 lbs. Acid Phosphate .....                              |                     |     | 100 lbs. Acid Phosphate .....                             |                     |
| 24 | 100 lbs. C-S. Meal .....                                  | 60.55               | 24½ | 200 lbs. C-S. Meal .....                                  | 55.41               |
|    | 100 lbs. Acid Phosphate .....                             |                     |     | 200 lbs. Acid Phosphate .....                             |                     |
| 25 | 50 lbs. C-S. Meal .....                                   | 52.36               | 25½ | 100 lbs. C-S. Meal .....                                  | 52.22               |
|    | 150 lbs. Acid Phosphate .....                             |                     |     | 300 lbs. Acid Phosphate .....                             |                     |
| 30 | 66 2-3 lbs. C-S. Meal.....                                | 48.68               | 30½ | 133 1-3 lbs. C-S. Meal .....                              | 43.54               |
|    | 66 2-3 lbs. Acid Phosphate .....                          |                     |     | 133 1-3 lbs. Acid Phosphate .....                         |                     |
|    | 66 2-3 lbs. Kainit .....                                  |                     |     | 133 1-3 lbs. Kainit .....                                 |                     |

**Remarks.**—In the planting of corn made on April 8, the soil was prepared the fall before, and five tons of stable manure per acre, was distributed broadcast on the land. The seasons were not altogether favorable for this planting. Plats Nos. 1, 1½, 23, and 23½ were affected by location. In the planting made June 10, the soil was prepared the fall before, and seeded to Hairy Vetch, with 250 lbs. Acid Phosphate and five tons of stable manure per acre. The treatment this soil had prior to corn planting, and the prolonged drought late in the season affected the results.

**Conclusions.**—Rock Floats gave better results than any other commercial fertilizer under corn.

Cottonseed Meal (Nitrogen) in most instances gave fair results. Acid Phosphate gave good results.

The farmers in the brown loam area can use from 200 to 400 pounds of Rock Floats on their better class of soils with good results.

On thinner soils, an equal mixture of high grade Cottonseed Meal, and Rock Floats, or Acid Phosphate, and from 100 to 300 pounds per acre may be used with fair results.

### Variety Test with Corn.

Ten varieties were used in this test. Each variety was planted in one-row plats, and then repeated a number of times, which distributed each variety throughout the soil employed in the test.

Plantings made April 10, 1908. Soil, ordinary valley land.

Fertilizers, five tons of stable manure the fall before, and 250 pounds of an equal mixture of Cottonseed Meal and Acid Phosphate per acre, in the drill before planting. Table 6 gives data obtained.

**TABLE 6—Variety Test with Corn.**

|                                       |                         |
|---------------------------------------|-------------------------|
| 1. Cockes' Prolific .....             | 70.55 bushels per acre. |
| 2. North Carolina Poor Land Corn..... | 68.88 bushels per acre. |
| 3. Alexander Six Ear .....            | 66.66 bushels per acre. |
| 4. Marlboro.....                      | 66.11 bushels per acre. |
| 5. Albemarle.....                     | 65.55 bushels per acre. |
| 6. Snow Flake .....                   | 63.33 bushels per acre. |
| 7. Mosby .....                        | 60.83 bushels per acre. |
| 8. Shaw's Improved .....              | 54.72 bushels per acre. |
| 9. Boon County White .....            | 51.37 bushels per acre. |
| 10. Hickory King .....                | 43.61 bushels per acre. |

**Remarks.**—Mosby variety was placed at a disadvantage on account of location, the seed were home grown, as was also North Carolina.

The other varieties were obtained from reliable seed houses in Georgia and North Carolina.

The seed, soil and climate in which a variety is grown, influences results.

Select a good variety, home grown preferred, and then maintain a breeding plat on the farm.

**FERTILIZER TEST WITH COWPEAS.**

Soil, light rolling upland. Date of plantings, June 9th and 13th. Two sets of plats, 1-20 acre; one set, 1-4 acre each. Table 7 gives the combined results obtained.

**Table 7.**

|                                                     | Lbs. Hay. | Lbs. Fruit. |
|-----------------------------------------------------|-----------|-------------|
| 1. No fertilizer .....                              | 1,180     | 281         |
| 2. 200 lbs. Acid Phosphate .....                    | 1,525     | 347         |
| 3. 200 lbs. Kainit.....                             | 1,555     | 381         |
| 4. 400 lbs. Rock Floats.....                        | 1,535     | 367         |
| 5. 200 lbs. Rock Floats .....                       | 1,340     | 264         |
| 6. 100 lbs. Acid Phosphate,<br>100 lbs. Kainit..... | 1,795     | 324         |

**Remarks.**—The season was unfavorable for the growth on thin soil. Date of planting too late for the class of soil and season.

**GRASSES AND FORAGE CROPS.**

With over 200 plats, consisting of both fall and spring plantings, on both valley and uplands, the following list of seed were used. Alfalfa, Bur Clover, Red Clover, Lespedeza, White Clover, Red Top, Alsike and Crimson Clover, Melilotus, Rape, Vetch, Sanfoin, Bermuda, and Orchard Grass, Blue Grass, Rye Grass, Johnson Grass, Meadow Fesque, Timothy, Florida Beggar Weed, German Millet, and Paspalum Dilatatum or Water Grass.

**Red Clover** with a small quantity of lime and stable manure made good growth on both valley and upland.

**Lespedeza.**—This plant is especially adapted to this section. Indications are that Phosphates increase the yield very materially. Cottonseed Meal also gives good results. With all things being taken into consideration, this is at present, the best forage and pasture plant for this section.

**Bermuda Grass.**—This plant made an excellent growth. Plantings made with Lespedeza, were very successful.

**Alfalfa.**—This plant has shown a disposition to want to grow, but so far it may be considered a failure. Fall prepared land with lime and stable manure, and spring plantings of seed with cultivation, offers so far, a hope for future success with this plant.



**Hairy Vetch.**—This plant made a most excellent growth on valley land, and with the addition of a small quantity of stable manure and phosphate, soil on which it refused to grow the year before, made a most excellent growth this past season. Early fall plantings with oats or wheat will give the best results.

**Florida Beggar Weed.**—This plant made an excellent growth on valley land.

**Red Top.**—This plant made a good growth, it is better adapted to low wet soils, and makes an early spring pasture. Where a sufficient amount of soil can be found for planting, this plant can be used to great advantage as a gully filling proposition.

**Rape.**—This plant made good growth on valley land, and responds nicely, to a liberal application of Cottonseed Meal and Acid Phosphate.

**Johnson Grass.**—This plant made poor growth, even with a liberal application of stable manure. No doubt cultivation induces growth.

**White Clover.**—This plant only makes a fair growth on the better class of soils.

The other plantings not above described made poor growth.

Early spring plantings of seed have given the best success, in almost every instance.

Mississippi Agricultural Experiment Station.

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BULLETIN No. 123

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INSPECTION AND ANALYSES OF  
COMMERCIAL FEEDING STUFFS

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI

JUNE, 1909.

# MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



## *Inspection and Analyses of Feeding Stuffs*

BY THE CHEMICAL DEPARTMENT OF THE

Mississippi Agricultural and Mechanical College.



|                                                         |                      |
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# INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS

## INTRODUCTION.

**The necessity for state inspection of feeding stuffs.**—The citizens of this state spend over two million dollars annually for commercial feeding stuffs. It is obvious that the actual value of the feeds on the market cannot be accurately determined by an examination on the part of the purchaser, and it may be fairly added that some manufacturers were not slow in recognizing this fact and in improving the opportunity of disposing of immense amounts of low grade or adulterated mixtures or products. This condition of affairs has been met in many states by legislation designed to correct the deception in the feeding stuff trade and to thereby restore for the benefit of the public a fair competition between the sellers themselves.

Following the example of almost all of the Southern states especially, our last legislature passed a law providing a system of analysis and inspection of feeds similar to that which the state has long maintained in the case of commercial fertilizers, and the requirements of this law will certainly ultimately become of the greatest benefit to those who must buy feeds, and to sellers and manufacturers generally who may now market their products on their merits without fear of competition with fraudulent materials.

**Other advantages of the feeding-stuff law.**—But a protection against deception is only one of the beneficial results which this legislation will bring about, since the analysis and inspection of feeds will necessarily involve a discussion of their constituents and the relation of these to the nutrition of animals. The functions, value and amount of the nutrients carried by all classes of feeds will be constantly before the attention of those interested in this trade. The wide dissemination of the results of chemical analysis and of information of this kind, which intelligent feeders and dealers must study because their interests are involved, will promote a general spirit of inquiry concerning the scientific aspects of the subject of feeding animals. In a similar way, farmers have learned much about the value and use of fertilizers, and they will now have a better opportunity of becoming acquainted with the composition and the rational use of feeding-stuffs.

It is scarcely necessary to point out also that the publication of analyses of official samples of all feeding-stuffs which are on sale in this state will



necessarily direct the attention of the public to the quality of the feeds handled by dealers, and, therefore, manufacturers and sellers everywhere will find it necessary, in order to retain their business, to see that their products are held up to the standard of excellence set by the best feeding stuffs on the market. **A proper relation between selling price and actual feeding value can be brought about when these chemical analyses are in the hands of the majority of important dealers and purchasers.** The relative value of a feed may be ascertained before it is bought, and, as an increasing knowledge of the composition and use of commercial feeds causes the public to exercise a wiser discrimination in purchasing them, and, as the competition based on actual chemical analyses and not on brand names or on general statements, is constantly promoted by the publication of authoritative information concerning every important kind and brand of feed offered for sale in the state, farmers and feeders should not only receive better feeds for the money which they expend for them, but they may feel reasonably assured also that the proper enforcement of this law will remove practically all opportunities for the sale of occasional lots of adulterated feed products or of mixtures of them.

A reasonable and just feeding-stuff law, when its benefits are properly understood, and appreciated by the public, will be heartily supported, and the honest manufacturer can find no just cause to complain that his feeds are inspected or that he must guarantee that they will not be found below the standard which he sets, and on the basis on which he sells them.

Since this bulletin presents for the first time the results of chemical analyses made under authority of the new law, the Act itself is published in full.

## CHAPTER 107.

### S. B. No. 367.

AN ACT to regulate the sale, inspection and analysis of commercial feeding stuff sold or offered for sale or use in the State of Mississippi.

SECTION 1. BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MISSISSIPPI, That any person, or persons, corporation, manufacturers, companies, dealers or agents who sell or offer for sale for use in this State, any commercial feed stuff which does not contain at least three and a half per cent of crude fat nor less than thirteen and a half per cent of crude fat and protein taken together, provided there shall not be less than three and a half per cent of crude fat in any instance and not more than twelve per cent crude fibre except cow and ox

feed containing cotton seed or its by-products, which said cow feed and ox feed shall be so branded provided said feeds shall contain at least three and a half per cent fat nor less than thirteen and a half per cent fat and protein combined shall be guilty of a misdemeanor and punishable by a fine of not less than one hundred dollars or imprisonment in the county jail of not more than six months, or both fine and imprisonment, for each offense.

SEC. 2. That it shall be unlawful to sell or offer for sale for use in this state any commercial feed stuff that is injurious to either animal or poultry for which it was made to be fed, because of its adulteration or injurious ingredients used therein, or inconsistency of proportions of crude fat, crude protein, crude fibre, and carbohydrates, although it may in all the above mentioned ingredients comply with section 1 of this Act, shall be guilty of a misdemeanor and punishable as provided in section 1 of this Act. But cotton seed, cotton seed hulls, cotton seed meal, hay, straws and fodders or the unmixed feeds made directly from the entire grain only of wheat, corn, rye, barley, oats and buckwheat, shall not be considered under the law as a commercial feed stuff.

SEC. 3. That it shall be the duty of any manufacturer or dealer in, or any person soliciting orders for, whether by sample or otherwise, or whether such orders are to be accepted by him or his principal, for the sale of any commercial feeding stuff before the same is offered for sale for use in this state, to submit to the state chemist for inspection, and for analysis by the state chemist a fair sample of the same, and to furnish a statement to be made upon blanks furnished for the purpose, setting forth, First, the name and brand under which said feeding stuff is to be sold, the number of pounds to be contained in a package, the name of the manufacturer; second, a statement setting forth the guaranteed percentage of crude protein, crude fat and carbohydrates in minimum figures only and the maximum percentage of crude fibre, these constituents to be determined by the methods adopted at the time by the Association of Official Agricultural Chemists of the United States, said statement to be accompanied by a sample or samples of not less than one pound of the feeding stuff to be offered for sale, which samples shall be held for analysis if necessary. The above statement and submitting of samples shall be considered as constituting a guarantee to the purchaser that every package of said feeding stuff contains not less than the amount of fat, protein, and carbohydrates and not more than the amount of fibre set forth in the statement and contained in the sample.

SEC. 4. That after the filing of statement and sample as provided for in section 3, the state chemist shall furnish to the manufacturer, dealer or agent having complied with the conditions therein, a certificate which shall entitle him to sell or offer for sale the said brand of commercial feeding stuffs so long as it comes up to the standard set in the statement and is not otherwise in violation of the provisions of this Act. Said certificate to be furnished without additional cost to the manufacturer, dealer, or agent.

SEC. 5. That all persons, manufacturers, companies, dealers, or agents, before selling or offering for sale for use in this state, any commercial feeding stuff, shall attach to each bag, barrel or other package, the name of the feeding stuff, if any, the net weight of the package, the name and address of the manufacturer, and the guaranteed percentage of crude protein, crude fat and carbohydrates in minimum figures only and also the maximum figure of crude fibre. The items shall be shown upon the tag as follows:

1. Net weight of package in pounds.
2. Brand, name and trade mark of feeding stuff, if any.
3. Name and address of the manufacturer or guarantor.
4. Protein guaranteed.
5. Fat guaranteed.
6. Carbohydrates guaranteed.
7. Maximum percentage of crude fibre guaranteed.

This information to be printed on a card to be attached to the package of feeding stuff, such cards to be not less than two inches wide and three and one-half inches long. Failure to attach this guarantee to any package, or the omission of the guarantee of any ingredients specified, shall be considered a violation of this Act, and the guilty party, firm, or corporation, upon conviction, shall be punished as provided in section 1 of this Act.

SEC. 6. That all manufacturers and manipulators, dealers and agents representing them, other person who has guaranteed for sale commercial feeding stuff, as herein provided, shall purchase from the state chemist inspection stamps, and he shall charge and collect for a sufficient number of stamps for one ton the sum of twenty-five cents. A stamp shall be attached to each package, barrel, or bag, and the stamp so attached shall be prima facie evidence that the seller has complied with the provisions of this Act. Any stamps left over in the possession of the manufacturer, or rightful owners, shall not be used for another season or year, but may be redeemed with new stamps within ninety days after the close of the fiscal year, which shall be



comprised between the dates of October 1st and September 30th, inclusive. There shall not be printed upon the said inspection tag any brand, name, or analysis, but shall have only the name of the state, the word "Guaranteed" and "Season of Year," and a facsimile signature of the state chemist. The use of said tags the second time upon the sale of any article shall be a misdemeanor and punished as provided in section 1.

SEC. 7. That any person, firm or corporation, manufacturing, dealing, selling or soliciting orders in the State of Mississippi, shall when an agreement is made to sell any lot of feeding stuff for use in this state, notify in writing before delivery of shipment to purchaser thereof, the state chemist, the amount of the lot sold, the name and address of the purchaser, as well as where shipped and date of shipment. Failure to comply with this requirement subjects the person, firm or corporation so failing with the penalties of a misdemeanor and punishable upon conviction as provided for in the code of 1906.

SEC. 8. That it shall be the duty of the state chemist to maintain a careful inspection of all commercial feed stuffs which are sold or offered for sale in this state and that he shall have collected and analyzed as many samples from the open markets of the state as in his judgment are necessary for the full protection of all purchasers. The analysis made under the direction of the state chemist shall be official, and it shall be admissible as evidence in any courts of the state on the trial of any issue involving the merits of feeding stuff analyzed.

SEC. 9. That it shall be the duty of the state chemist to issue quarterly, or oftener if deemed necessary, bulletins for general distribution, setting forth the brands of commercial feeding stuffs in this state, the analysis of the same as claimed by the manufacturer thereof, together with the comparative analysis as shown by sample collected and analyzed, and if known, their commercial value.

SEC. 10. That the state chemist shall have the authority to establish such rules and regulations in regard to the inspection, sale and analysis of commercial feeding stuff as defined in this Act, which are not inconsistent with the provisions thereof, and which, in his judgment best carry into effect its requirements.

SEC. 11. That the state chemist who is professor of chemistry at the Agricultural and Mechanical College, shall be official chemist within the provisions of this Act, and that the sum of one (1.00) dollar be paid the chemical department for each and every sample analyzed for use in purchasing the necessary chemicals for the work.



SEC. 12. That the state chemist shall have the right to appoint sufficient inspectors and other assistants to effectually carry out the provisions of this Act.

SEC. 13. All funds collected by the state chemist shall be deposited in the treasury of the Agricultural and Mechanical College, and shall be used for completing and equipping the chemical laboratory and for the benefit of Farmers' Institutes in this state.

SEC. 14. Nothing in this Act shall be construed so as to require an analysis and branding of cotton seed, cotton seed hulls, and cotton seed meal or any mixture thereof.

SEC. 15. That all laws in conflict with the provisions of this Act be, and the same are hereby, repealed, and that this Act take effect on the first day of July, 1908.

Approved March 21, 1908.

#### BRIEF SUMMARY OF THE REQUIREMENTS OF THE LAW.

**Feeds to be inspected.**—This law includes all materials and by-products sold or used for feeding except cotton-seed meal (inspected under the fertilizer Act) cotton-seed hulls, or mixtures of meal and hulls, hays, straws, etc., and **unmixed** feeds consisting of the **entire** grains of the common cereals.

**Requirements concerning composition of feeds.**—(1) **Minimum amounts of fat and protein allowable**—No feed can be sold that does not contain at least 3.50% of crude **fat**, and the sum of the fat and **protein** in all kinds of feed must be guaranteed to equal 13.50%.

(2) **Maximum amount of fiber.**—No ordinary feed may contain more than 12.00% of **crude fiber**. See discussion of value of fiber in feeding stuffs on page 16. It is provided in section I, however, that those feeds carrying cotton-seed products may contain more than 12.00% of fiber if they are branded "Cow and Ox Feed," but the requirements concerning minimum limits of fat and protein (See Sec 1) must be complied with by all feeds.

(3) **Tagging bags of feed.**—Each bag of feeding stuff sold in this state must carry **two** tags:

(a) A state inspection tag. These tags are prepared by the state laboratory for sale to manufacturers. They are numbered consecutively and packed in boxes containing 1,000 tags each. It is very inconvenient to supply a smaller number than 500 on any single order.

(b) A manufacturer's or guarantor's tag. This tag is prepared by the manufacturer or original shipper. It must give all of the information outlined in section 5 of the law. It is **important** for

manufacturers to see that the guaranteed analysis printed on this tag is identical with that filed in the office of the state chemist. Some cases have come to light in which the guaranty printed on this tag was found to be higher than the official guaranty. This, of course, is unfair and misleading.

**(4) Guaranteed analysis.**—The composition of all feeds must be guaranteed to the purchaser. Before a feeding-stuff can be offered for sale, the person, firm, or agent responsible for the manufacture or sale of it must file in the office of the state chemist (blank forms are provided for this) a guaranteed analysis giving the minimum amounts of fat, protein and carbohydrates and the **maximum** amount of crude fiber which the feed will contain, and the product actually supplied the trade must not be found by analysis to contain a smaller percentage of any of the valuable constituents or a greater percentage of fiber than specified in the guaranty. **A sample of each feed sold in the state must be forwarded to the state laboratory when a guaranty for it is filed.** (See section 3.)

**Use of rice hulls prohibited.**—The sale of rice hulls in this state or the use of these hulls in compounding feeds of any kind is prohibited under authority of section 2. The hulls of rice are so hard and silicious that they are not only indigestible but also irritate the digestive tract of the animal to such an extent that death not infrequently results. Rice hulls are injurious, therefore, within the meaning of section II of the law and this by-product cannot be legally sold in the state.

## **THE COMPOSITION, VALUE, AND USE OF COMMERCIAL FEEDING-STUFFS.**

**Introduction.**—The composition and relative value of the various materials used for feeding animals have formed for a long time frequent subjects of inquiry and careful investigation by experiment stations in this and in other countries, and agricultural journals everywhere have constantly assisted in the dissemination of the principles of feeding, and the results and studies of scientists, as well as the observations of practical feeders.

Of course much remains to be learned concerning animal nutrition but the almost numberless investigations and studies of the most varied character which have been made during the last fifty years especially have supplied the data upon which certain well defined principles of modern feeding methods depend. While the question is not yet solved, these basic principles must form our safest guide, since they rest upon facts which were obtained in experimental studies. The

progress of knowledge of the subject may lead to a modification of conclusions now held, but the accumulation of facts is lasting.

**Composition of plants and animals compared.**—The almost numberless substances which occur in plant and animal bodies may be conveniently grouped in four general classes, which are entirely sufficient for the purpose of this discussion. As the inspection of feed progresses, feeders and dealers must necessarily become more familiar with the use of these terms.

All animals and plants may be said to consist in greater part of **Water,—Ash,—Protein,—Fat—and Carbohydrates.**

But the above substances, of course, do not occur in similar proportions in the bodies of animals and plants. In fact, carbohydrates exist in very small amounts in animals, and, for this discussion they may be neglected. The following tabular statement (Bulletin No. 1, 3rd ed., Penn. State College) will illustrate the classification of substances from which animal and plant bodies are constructed:

#### Ingredients of Animals.

1. Water.
2. Ash.
3. Protein.
4. Fat.

#### Ingredients of Plants.

1. Water.
2. Ash.
3. Protein.
4. Fat.
5. Carbohydrates.

As an illustration of the difference in composition between animals and plant products, we may compare below the composition of a corn and oat feed with that of a well-fed ox:

#### COMPOSITION OF A WELL-FED

##### OX.

|                                           |        |
|-------------------------------------------|--------|
| 1. Water,                                 | 54.30% |
| 2. Ash,                                   | 4.80%  |
| 3. Protein,                               | 15.80% |
| 4. Fat,                                   | 7.10%  |
| Contents of<br>Stomach and<br>Intestines, | 18.00% |

---

Total, 100.00%

#### COMPOSITION OF CORN AND OAT

##### FEED.

|                  |        |
|------------------|--------|
| 1. Water,        | 11.90% |
| 2. Ash,          | 2.20%  |
| 3. Protein,      | 9.70%  |
| 4. Fat,          | 4.50%  |
| 5. Carbohydrates | 71.70% |

---

Total, 100.00%

The three important classes of substances in the animal body, viz.: **ash, protein and fat**, must be derived entirely from plants, other

\* Bul. 108, Bureau of Chem., U. S. Dept. Agr., p. 40.

† Bul. No. 1, 3d ed., p. 3, Penn. State College.



animals, or from both. How to supply in proper amount and most cheaply feeds which contain the nutrients, fat, protein, and carbohydrates in proper proportions and in a digestible and palatable form for various animals kept under different conditions and for widely different purposes is a problem for the feeder.

With the foregoing statements in view, a moment's reflection is sufficient to emphasize a gross and not very uncommon error of purchasing commercial mixed feeds, especially largely upon the gross price per ton, because it is plain that the value to the animal of a ton of any "properly balanced" and palatable feeding stuff is measured entirely by the number of pounds of digestible "nutrients" which a ton of the feed contains.

**Functions of nutrients in feeds.**—The **nutrients** contained in all feeds and by which they are to be valued, viz.: **fat**, **protein**, and **carbohydrates** have different functions to perform, of course, in the nutrition of the animal. Out of the nutrients the animal body must be constructed.

**The Ash** in feeds consists of the substances which the plants secured from the soil and which remain behind in greater part after the feed is burned. Animals contain two to five per cent of ash, most but not all of which is in the bones and teeth. While ash in a proper sense is an important nutrient perhaps especially for growing animals, it is not considered usually in buying feeds, most kinds of which probably carry sufficient ash ingredients for ordinary mature animals.

**Protein** is one of the most important constituents of the animal body and one of the most essential substances consequently in feeds, because the animal must secure all of the material for its protein from that already formed in the feed. Protein (together with water and ash) forms by very far the greater part of the muscles, blood, nerves, hair, horn, tendons, etc. Since all of these must be made entirely from the protein bodies in the original feed, the importance of protein in feeds is apparent. If the bodies of ordinary well-fed farm animals were completely dried out, about one-fourth to one-third of the remaining weight would consist of proteid compounds.

The proteins differ from the other nutrients in feeds in that most of them contain an average of 16% of **nitrogen**. Fat and carbohydrates contain no nitrogen. But nitrogen is an expensive plant food substance, and so it becomes that protein is the most expensive constituent of animal foods. It is usually safe to assume that the cheap ready-to-use mixed feeds do not contain a large percentage of protein, because the manufacturer would be forced to mix with other



substances some expensive material rich in protein, and the resulting mixture could not be offered at an unusually low price.

We have here an illustration of the importance of the chemical analyses which this bulletin contains. The purchaser cannot determine the amount of protein in a feed, and the law provides therefore, that all feeds be guaranteed to contain a certain amount, and chemical examinations are being made continually to ascertain that these guaranties are being observed properly by manufacturers.

It should be pointed out finally that the term protein is applied to the more important groups of nitrogenous organic compounds of plants and animals, and it is not a name, therefore, of simply a single substance. Leaving water out of consideration, it may be said (see analysis page 11) that it is the predominant constituent of animals.

Since, for the usual purpose of feeding stuff analyses, the nitrogenous or protein substances contain an average of 16% of nitrogen, we may compute the protein in a feed if we know or determine how much nitrogen it contains; for, since we assume that  $16.00\% = \frac{16}{100}$  of protein is nitrogen, it follows that the percentage of nitrogen multiplied by  $\frac{100}{16}$  equals 6.25, will give us a close approximation of the protein in ordinary plant and animal substances. All protein determinations in this bulletin have been made in this way. An error of 1-10 of 1.00% in the estimation of nitrogen corresponds to 0.625% of protein, and the magnitude of this variation is sufficient to illustrate the great care which must be exercised in all of these nitrogen determinations.

**Fat in animals.**—The amount of fat in animals is naturally subject to wide variations, and depends of course on condition of the animal. The following short tabular statement will illustrate this clearly.

**Showing Amount of Fat in Live Animals.\***

|                     | OX.   | SHEEP. | SWINE. |
|---------------------|-------|--------|--------|
| When well fed ..... | 7.10  | 13.20  | 22.50  |
| When half fat ..... | 14.90 | 18.30  |        |
| When fat .....      | 26.80 | 28.10  | 40.20  |
| When very fat ..... | 37.20 |        |        |

Food digested in larger amount than necessary for the requirements of the animal is stored up as a source of heat and energy in the form of fat, and this supply is drawn upon in time of need, the animal becoming lean if unable to obtain sufficient food to replace it. When

\* Farmers' Bul. 343, U. S. Dept. Agr., p. 6.

fat animals become lean, as just described, the disappearing fat does not pass out of the body with the feces. It is slowly burned up producing its equivalent amount of heat and energy to keep the body warm and to perform the work required in an external way as well as that demanded by digestive and other processes going on within the body itself. The products of the slow burning of fat in the body are water and a gas (carbon dioxide) which are constantly evolved through the lungs.

In a somewhat similar manner, the combustion of coal under boilers supplies heat which, being transferred to steam, is subsequently transformed into mechanical energy by engines, and the products of the combustion, water vapor and the same gas referred to above, pass out through the smoke stack, thus removing from the combustion chamber of the boiler furnace the products formed by the burning coal, as the lungs and air passages remove from the animal body the compounds produced by the slow burning of the fats. If, therefore, an animal is deprived of food, the fat held in reserve will be used instead to supply warmth and energy, and when this supply fails, the protein (lean flesh, etc.) will be similarly burned away until, lacking further material from which the necessary heat and energy for the support of life processes may be derived, death results.

**Source of animal fat.**—It has been pointed out that a large proportion of the weight of live animals consists of protein compounds, and the fact that all animal proteids must have existed as plant proteids was emphasized. In other words animal proteids are formed (for our present purpose) entirely from plant proteids. Now, this is not the case with the animal fats. It has been shown, for example, that a dairy cow can be made to produce more fat in the form of butter than is contained in all of the feed consumed by her. This means, of course, that other constituents of feeds, besides the fat actually contained in them, may contribute materials out of which an animal may construct fat to be stored up in its body or continually supplied in its milk. This fact, however, cannot justify an assumption that fat in feeds has no special function to perform. On the contrary it is an important constituent, and a proper proportion of it is certainly essential in the nutrition of farm animals.

**Fat in feeding stuffs.**—Reference to the table on page (25) will illustrate the variation in the percentage of fat in common feed materials. The fat in oil-bearing seed is familiar enough, but hays, grasses, and seeds of all kinds contain it, though it may not be so apparent.

Ordinary ether is an efficient solvent for oils and fats and their amount in feeds is determined by a thorough extraction in a special form of apparatus by fresh portions of dry ether. But ether may dissolve from the feed small amounts of other substances, and, therefore, the ether extract is reported as "crude fat" or simply as "ether extract." The law now in force in this state requires all feeds to be guaranteed by the manufacturer to contain a minimum of 3.50 % of fat.

### **Carbohydrates.**

**Concerning the nature of the carbohydrates.**—This term refers to groups of nutrients in feeds of which starch and sugar are our most familiar examples. Rice, corn, wheat, potatoes, etc., are rich in starch, while sugar beets, sugar cane, ripe fruits, etc., contain, of course, a great deal of sugar. Cotton and other fibers, paper, and the woody parts of plants in general are composed most largely of **cellulose** which is an important carbohydrate. The term is intended to include certain compounds also which, strictly speaking, are not carbohydrates, but which nevertheless possess values as nutrients.

Some kinds of carbohydrates are transformed into other kinds in the animal body or by appropriate treatment otherwise. The manufacture of glucose sugar from starch by heating with dilute sulphuric acid is carried out on an immense scale, and it is well known that starch is largely converted into sugar or other soluble carbohydrates in the process of digestion.

**"Carbohydrates" in feeding stuff analyses.**—While the fibrous and woody parts of plants consist most largely of cellulose and other related bodies, and while cellulose is certainly a true carbohydrate, the use of this term within the meaning of the Mississippi law refers only to the more digestible forms of them, such as starch, sugar, gums, etc., bodies more appropriately designated collectively in ordinary chemical analyses as **"Nitrogen-free Extracts."**

By the provisions of this law the fibrous and woody parts of feeds are set apart from the more easily soluble and digestible carbohydrates, and these are included under **"Crude Fiber."** See page (16) for discussion of this.

**Carbohydrates the predominating constituents of ordinary feeds.**—Just as the protein compounds exist in the bodies of well fed (but not too fat) animals in larger proportion than other constituents (water not considered), and as these proteins may be regarded as the distinctive constituents of animals, we may likewise view the carbohy-



drates as the distinctive and predominating ingredients of ordinary feeds, since analyses show them to be present usually in larger proportion than any other, and in most cases, than all other components combined.

**Carbohydrates in animals.**—While the proportion of carbohydrates in feeds is very large, the amount of these compounds in animal bodies is **very small**. The liver, muscles, and other organs also perhaps contain small quantities of "glycogen" which is a carbohydrate, and milk carries about 4.75% of "milk sugar." Nevertheless these compounds are, for immediate consideration in this connection, of negligible importance.

**Functions and importance of the carbohydrates as Nutrients.**—It has been well made out that the carbohydrates can be used by animals as materials from which fat stored in the body or given off in milk may be made. Both carbohydrates and fat are sources of heat and energy to the animal, but **one** pound of fat will supply approximately as much heat and energy as **two** and a quarter pounds of carbohydrates.

**Crude fiber.**—The crude fiber reported in these analyses refers to the tough and largely indigestible woody portions. Its determination is important as throwing light upon the character of the feed. For example, a high fiber content in the so-called corn and oat feeds indicates excessive use of oat hulls, and the adulteration of wheat and corn bran, shorts, and corn chops, etc., with ground corn cobs is certain to result in a higher fiber content, since cobs contain a great deal of fiber.

Concentrated feeds rich in fat, protein and carbohydrates cannot carry a large percentage of fibers, and the law does not allow the sale of feeds in the state which contain more than 12.00 %, except in those plainly branded "Cow and Ox Feed," and these must consist in part of cotton-seed, meal, or hulls.

**Digestibility of feeding stuffs, co-efficients of digestibility.**—It is obvious that the value to the animal of the nutrients of feeds discussed in the foregoing paragraphs depends upon their digestibility. The percentage of a nutrient which is found to be digestible is the "digestion coefficient." The nutrients in a given feed are not equally digestible, and it is to be expected that feeds will differ markedly between themselves in point of digestibility of the nutrients carried by them. The short table which follows will show the percentage digestibility of the nutrients of some common feeding stuffs.



\*Table of Digestion Coefficients:

|                                                     | FAT       | PROTEIN   | CARBO-<br>HYDRATES | FIBER     |
|-----------------------------------------------------|-----------|-----------|--------------------|-----------|
|                                                     | Per cent. | Per cent. | Per cent.          | Per cent. |
| Corn .....                                          | 86        | 76        | 93                 | 58        |
| Corn meal .....                                     | 92        | 66        | 93                 |           |
| Corn and cob meal.....                              | 84        | 52        | 88                 | 45        |
| Oats .....                                          | 83        | 78        | 76                 | 20        |
| Cotton-seed .....                                   | 87        | 68        | 50                 | 76        |
| Corn and oat feed .....                             | 87        | 71        | 83                 | 48        |
| Wheat bran.....                                     | 68        | 79        | 69                 | 22        |
| Wheat middlings .....                               | 85        | 82        | 85                 | 36        |
| Cotton-seed meal .....                              | 93        | 88        | 64                 | 32        |
| Brewers' grains.....                                | 91        | 79        | 59                 | 53        |
| Cotton-seed hulls .....                             | 79        | 6         | 34                 | 47        |
| Cotton-seed hulls when<br>fed with C. S. meal ..... | 85        | 62        | 54                 | 46        |
| Molasses.....                                       |           |           | 86                 |           |
| Corn fodder .....                                   | 63        | 56        | 59                 | 61        |
| Timothy hay.....                                    | 57        | 48        | 63                 | 52        |
| Johnson grass hay .....                             | 39        | 45        | 54                 | 58        |
| Red clover hay .....                                | 62        | 62        | 69                 | 49        |
| Pea vine hay.....                                   | 50        | 65        | 71                 | 43        |
| Alfalfa hay .....                                   | 39        | 74        | 66                 | 43        |
| Vetch hay .....                                     | 60        | 76        | 66                 | 54        |
| Peanut hay .....                                    | 66        | 63        | 70                 | 52        |

**Raw Materials Used in the Manufacture of Commercial Mixed Feeds.**

**Cotton-seed meal.**—Meal is one of the most valuable of all “concentrates.” It carries a larger percentage of protein than any other commercially available material of importance. A good product will contain about 40% of protein and 8-10% of fat or oil.

Experiments at the Mississippi Experiment Station (Bul. 60) show that for dairy cows **one** pound of c. s. meal is the equivalent in feeding value to **two** pounds of corn and cob meal and to 1.71 pounds of whole cotton-seed.

For beef production **one** pound of c. s. meal equalled 1.92 pounds of corn and cob meal and to 1.60 pounds of whole cotton-seed.

**Cotton-seed hulls.**—Hulls have proven an excellent roughage for mixing with concentrates in preparing a balanced ration. Hulls of

\* Principally from Henry's Feeds and Feeding, 625-630.

average quality should contain: Fat 2.00%, protein 4.00%, carbohydrates 36.60%, fiber 44.40%.

### Corn Products.

**Starch by-products.**—In the manufacture of starch and glucose in this country, corn is ground in water after the grains have been softened by steeping in warm water slightly acidified with sulphuric acid. The resulting product is separated by sieves and by gravity, the sieves retaining the husks and the germs of the grains. The gluten is separated from the starch by gravity as already explained.

A recent report gives the average composition of **gluten meal** as follows: Fat 6.30, protein 29.40, carbohydrates 52.40, fiber 1.60.

**Gluten feed**—Consists of the dried gluten, husks, and germs. It contains approximately: Fat 3-4.5%, protein 20-26%.

**Germ meal**—Is produced in starch manufacture. The germs are separated, the oil extracted and the residue ground. It is easily digestible, and an excellent feeding stuff. Approximate composition: Fat 7.10%, protein 11.10%, carbohydrates 62.50, fiber 9.90%.

**Hominy feed.**—This is a by-product in corn milling. It consists of the germ of the grain, the husks, and small portions of the starchy part of the grain. Composition approximately as follows: Fat 8.30%, protein 9.80%, carbohydrates 64.50%, fiber 3.80%.

**Corn Chop.**—This is the coarsely crushed grain. It should contain about: Fat 4.00-4.50, protein 9.50%, carbohydrates, 68.00%, fiber 2.00%.

**Corn and cob meal.**—The meal resulting from grinding the entire ear. It should carry approximately: Fat 3.50%, protein 8.50%, carbohydrates 64.80%, fiber 6.60%.

**Corn bran.**—This is a familiar product. Average composition: Fat 5.80, protein 9.00%, carbohydrates 62.20, fiber 12.70%. Corn bran contains much less protein than wheat bran.

**Corn cobs.**—Corn cob meal is often used to adulterate feeding stuffs, especially wheat bran. The material is naturally fibrous and does not possess a high value as a source of nutrients. Average composition: Fat 0.50%, protein 2.40%, carbohydrates 54.90%, fibre 30.10%.

### Wheat Products.

**Wheat bran.**—This is a well known product consisting of the outer part of the wheat grain with a small amount usually of the starchy portion. It is often adulterated (See analyses in this bulletin under

Hardy Grain Co.) but pure bran is a valuable feed containing about: Fat 4.00%, protein 15.40%, carbohydrates 53.90, fiber 8-9%.

**Middlings and shorts.**—No especial distinction appears to be made in the trade in regard to middlings and shorts which consist of the finer particles of bran mixed with more or less of the starchy part of the grain. The products are excellent feeding stuffs. Average composition middlings: Fat 4.00%, protein 15.60%, carbohydrates, 60.40%, fiber 4.60%.

**"Red Dog flour."**—This is a very low grade flour, but it is nevertheless richer in protein than flour of high grade.—Somewhat variable in composition: Fat 1.75-5.00%, protein 14-19%.

### Oat Products.

**Oat hulls.**—It is well known that these are obtained as a by-product in the manufacture of rolled oats. The hulls are employed by manufacturers as a filler in the preparation of mixed feed. The product is naturally high in fiber, of which whole oats will contain 9-10%. One hundred pounds of oat hulls will contain **digestible nutrients** in pounds approximately as follows: Fat 0.60, protein 1.30, carbohydrates 40.10. Approximate composition of oat hulls: \*Fat 1.10, protein 2.90, carbohydrates 52.10, fiber 31.60. It can be seen from the above that hulls do not possess a high value as a source of digestible nutrients. The material is used in feeds as a diluent and as a roughage for concentrates.

**Oat middlings.**—A by-product in the manufacture of breakfast food. Approximate composition: \*Fat 6.45, protein 7.74, carbohydrates 56.91, fiber 5.79.

### Rice Products.

**Rice hulls.**—The sale or use of rice hulls in mixed feeds is prohibited in Mississippi, since the product is dangerous and not infrequently causes the death of animals.

It is to be regretted, however, that these hulls are often finely ground and used to adulterate rice bran and rice meal.

The approximate percentage of hulls in rice bran may be computed by the use of the following formula\*:

†Per cent hulls equals  $3.33 \times (\text{per cent fiber} - 10)$ .

In the above formula, hulls are assumed to carry 40% and rice bran 10% fiber. On this basis, a rice bran showing 25% of crude

\* Bul. 108, Bureau Chem., U. S. Dept. Agr., pp. 38-39.

† Bul. No. 77, Louisiana Exp. Sta., p. 440.



fiber on analysis would contain approximately 49.95% added rice hulls, for

$3.33 \times 25 - 10$  equals 49.95%.

Approximate composition of rice hulls: Fat 0.50%, protein 3.50%, carbohydrates 37.00%, fiber 40.00.

**Rice meal.**—This is the most nutritious of the rice by-products. Approximate composition: Fat 13.00%, protein 12.00%, carbohydrates 51.00%, fiber 5.40%.

**Rice Polish.**—This is also an excellent feed but not quite so rich in protein and fat as rice meal. Approximate compositions: Fat 7.30%, protein 11.70%, carbohydrates 58.00%, fiber 6.30%.

**Rice bran.**—Rice bran, usually found on the market, is often a mixture of rice hulls and the pure bran. The adulterations with hull varies greatly. Samples containing over 70% of rice hulls have been analyzed, and dealers and feeders are especially cautioned in purchasing this product. A pure rice bran is an excellent feed, but bran adulterated with hulls is unsafe, and its sale should not be allowed. Approximate composition: Fat 8.80%, protein 12.10%, carbohydrates 49.90%, fiber 9.50%.

**By-products of brewing and distilling industries; dried brewers' grains.**—In the preparation of beer and similar beverages, barley is sprouted, and the sprouts are separated after drying the product. These are sent into the trade as "malt sprouts." The remainder of the grain is used in the preparation of the wort. In the malting process, a large percentage of the starch is converted into maltose a kind of sugar, and into dextrin. The maltose and dextrin thus formed are used in the manufacture of the malt liquor, and the residue is dried and sold as "brewers' grains."

Since in the process briefly outlined the large proportion of the starch of the original grain is removed, the dried residue must necessarily contain a relatively smaller percentage of carbohydrates, and, therefore, the percentages of other nutrients carried by the grain be relatively greater. Approximate composition of dried brewers' grains: Fat 7.00%, protein 23.90%, carbohydrates 43.30%, fiber 13.20%.

**Malt sprouts.**—The preparation of this product has been described above. Approximate composition: Fat 1.71%, protein 25.15%, carbohydrates 45.98%, fiber 11.40%.

**Distillers' grains.**—This product consists of the residue obtained in the preparation of whisky or of alcohol from various grains. It



is well known that corn and rye, or mixtures of these, are most often employed.

A large portion of the starch originally present in the grain is converted into sugar, which is subsequently fermented, producing alcohol, and this is separated by distillation. The residue is dried and sold as distillers grains, and the partial removal of the starch results, of course, in increased percentages of fat, protein, and fiber, as already pointed out in the case of brewers' grains.

Approximate composition: \*Fat 13.74%, protein 31.49%, carbohydrates 32.94%, fiber 12.55%.

### **Molasses Feeds.**

Molasses used for mixed feeds is not suitable for human consumption. The sugar is extracted as thoroughly as possible from the cane juice until there remains a product carrying the mineral constituents of the juice, together with a small quantity of nitrogenous matter and varying amounts of cane sugar, invert sugars, gums, etc. It should be pointed out that the nitrogenous matter in molasses does not possess the same nutritive value as that in ordinary feeds. The manufacturers of molasses feeds pay little attention, however, to this product as a source of protein, since the amount in the molasses is almost negligible.

Molasses, therefore, is distinctively a carbohydrate feeding stuff, the carbohydrates being present most largely as sugars. Cane molasses will contain approximately: Water 25.00%, sugars, etc., 60-68%. Fat and fiber are not present, and the proteins occur in very small amounts as already stated. Molasses can be obtained from the plantations for 6 to 10 cents a gallon.

**Molasses grains.**—This product is often prepared by mixing cane molasses with brewers' or distillers' grains, the mixture being dried to prevent fermentation. These grains are rich in protein and poor in carbohydrates, the molasses being rich in carbohydrates and almost lacking in protein.

**Molasses in mixed feeds.**—Molasses may be used to the extent of 10-30%, depending upon the nature of the products with which it is incorporated. In any case, some of the water must be driven off by means of warm air or by heating. Too much moisture in these feeds may allow fermentation to take place in warm weather.

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\* Bul. 108, Bureau Chem., U. S. Dept. Agr., p. 32.

The carbohydrates contained in the molasses, and on the basis of which the material is valued, are naturally easily digestible, and properly prepared molasses feeds are very palatable.

### Alfalfa Meal.

Alfalfa meal is being used extensively in mixed feeds sold in this state. It contains almost as much protein as wheat bran, and, when cut at the proper stage, the nutrients contained in it are quite digestible. It is hardly necessary to state that alfalfa meal must be used with feeding stuffs richer in fat and carbohydrates, since these nutrients occur in relatively small amounts in the meal itself. Approximate composition: Fat 2.20%, protein 14.30%, carbohydrates 42.70%, fiber 25.00%.

### ADULTERATION.

The unscrupulous manufacturer of feeds is always tempted, of course, to increase his profits by adulterating pure products with cheap materials of less value to the purchaser. Corn chops and wheat bran are sometimes adulterated with cob meal, and peanut hulls, rice hulls, corn bran, weed seed, and screenings from corn, wheat, and flax are common adulterants. Some of these possess a distinct value as sources of nutrients, but they are mixed with more expensive products of much greater feeding value. The following table shows the composition of some of the more common adulterants.

#### \*Composition of Some Materials Used to Adulterate Feeding Stuff.

| MATERIAL.              | Crude<br>Fat<br>Per cent. | Crude<br>Protein<br>Per cent. | Carbohy-<br>drates<br>Per cent. | Crude<br>Fiber<br>Per cent. |
|------------------------|---------------------------|-------------------------------|---------------------------------|-----------------------------|
| Ground corn cobs.....  | 0.40                      | 2.20                          | 57.70                           | 31.20                       |
| Peanut hulls .....     | 1.20                      | 5.50                          | 13.70                           | 70.90                       |
| Rice hulls .....       | 0.70                      | 2.10                          | 36.10                           | 37.40                       |
| Weed seeds .....       | 7.00                      | 13.30                         | 53.90                           | 11.60                       |
| Buckwheat hulls .....  | 1.00                      | 4.90                          | 38.50                           | 43.10                       |
| Oat hulls .....        | 0.60                      | 2.30                          | 52.00                           | 33.30                       |
| Wheat screenings ..... | 2.30                      | 11.90                         | 64.20                           | 8.40                        |
| Flax screenings.....   | 12.30                     | 15.30                         | 39.40                           | 15.50                       |
| Corn screenings .....  | 2.70                      | 8.60                          | 64.40                           | 8.60                        |
| Corn bran .....        | 5.80                      | 9.00                          | 62.20                           | 12.70                       |

\* Kentucky Bul. No. 131, p. 61, and partly also from Indiana Bul. No. 131, p. 324.

### Value of Manure from Concentrated Feeds.

Methodical experiments have shown repeatedly that we are safe in assuming that about 80% of the fertilizer constituents of feeds may be recovered in the manure of the animals fed. This refers, of course, to the urine as well as the solid excrement. Farmers who are accustomed to the purchase of commercial fertilizers may be somewhat surprised to note the high value of the manure from the more concentrated feeds. That a wise economy demands the careful preservation of this manure will be generally admitted, and the figures in the short tabular statement below will serve a useful purpose in directing more careful attention to the value of manures from these feeds.

Every concentrated feeding stuff possesses, therefore, two distinct values, a feeding value and a manurial value, and, so far as possible, the farmer and feeder should certainly arrange to make the fullest possible use of them, and consequently, this is a matter which should not be overlooked in the purchase of feed supplies. If several feeds of approximately the same nutritive value and cost are obtainable, the product or mixture containing the greatest amount of fertilizer constituents is naturally the most desirable and should be chosen.

Assuming that 80% of the manurial value of feeds is recoverable in the manure, and assigning a value of 5c a pound for phosphoric acid, 5c a pound for potash, and 20c a pound for nitrogen, the value of a ton of manure from several common feeds is computed in the table which follows.

(Values Computed on Basis of 80% Recovery.)

| MATERIAL                   | Nitrogen<br>Per cent. | Phosphor-<br>ic Acid<br>Per Cent. | Potash<br>Per cent. | Approximate<br>Manurial<br>Value<br>Per Ton. |
|----------------------------|-----------------------|-----------------------------------|---------------------|----------------------------------------------|
| Cotton Seed .....          | 3.13                  | 1.27                              | 1.17                | \$11.97                                      |
| Cotton-Seed Meal .....     | 6.79                  | 2.88                              | 1.50                | 25.23                                        |
| Cotton-seed Hulls .....    | 0.69                  | 0.25                              | 1.02                | 3.22                                         |
| Corn .....                 | 1.82                  | 0.70                              | 0.40                | 6.70                                         |
| Corn and Cob Meal .....    | 1.41                  | 0.57                              | 0.47                | 5.34                                         |
| Corn Bran .....            | 1.63                  | 1.21                              | 0.68                | 6.73                                         |
| Gluten Meal .....          | 5.03                  | 3.30                              | 0.50                | 19.14                                        |
| Gluten Feed .....          | 3.84                  | .....                             | 0.41                | 12.62                                        |
| Wheat Bran .....           | 2.67                  | 2.89                              | 1.61                | 12.14                                        |
| Wheat Middlings .....      | 2.63                  | 0.95                              | 0.63                | 9.68                                         |
| Oats .....                 | 2.06                  | 0.82                              | 0.62                | 7.74                                         |
| Oat Shorts.....            | 1.72                  | 0.91                              | 0.53                | 6.66                                         |
| Oat Hulls .....            | 0.52                  | 0.24                              | 0.52                | 2.27                                         |
| Rice Polish .....          | 1.97                  | 2.67                              | 0.71                | 9.01                                         |
| Rice Bran .....            | 0.71                  | 0.29                              | 0.24                | 2.70                                         |
| Dried Brewer's Grains..... | 3.62                  | 1.03                              | .....               | 12.41                                        |
| Malt Sprouts .....         | 3.55                  | 1.43                              | 1.63                | 13.81                                        |
| Peas .....                 | 3.08                  | 8.20                              | 0.99                | 17.21                                        |
| Soja Beans .....           | 5.30                  | 1.87                              | 1.99                | 20.05                                        |
| Mixed Hay .....            | 1.41                  | 0.27                              | 1.55                | 5.97                                         |
| Timothy Hay .....          | 1.26                  | 0.53                              | 0.90                | 5.18                                         |
| Soja Bean Hay .....        | 2.32                  | 0.67                              | 1.08                | 8.82                                         |
| Red Clover .....           | 2.07                  | 0.38                              | 2.20                | 8.69                                         |
| Crimson Clover .....       | 2.05                  | 0.40                              | 1.31                | 7.93                                         |
| Peavine Hay .....          | 1.95                  | 0.52                              | 1.47                | 7.83                                         |
| Alfalfa Hay .....          | 2.19                  | 0.51                              | 1.68                | 8.76                                         |

\* Analyses from Henry's Feeds and Feeding, pp. 631-634.



**Table Showing Composition and Digestible Nutrients in Common  
Feeding Stuffs.\***

| FEEDING STUFF.                                         | AVERAGE COMPOSITION.  |                              |                                |                            | DIGESTIBLE NUTRIENTS.     |                       |                              |                                |
|--------------------------------------------------------|-----------------------|------------------------------|--------------------------------|----------------------------|---------------------------|-----------------------|------------------------------|--------------------------------|
|                                                        | Crude fat<br>Per cent | Crude<br>Protein<br>Per cent | Carbo-<br>hydrates<br>Per cent | Crude<br>Fibre<br>Per cent | Dry<br>Matter<br>Per cent | Crude fat<br>Per cent | Crude<br>Protein<br>Per cent | Carbohy-<br>drates<br>Per cent |
| Corn .....                                             | 5.00                  | 10.30                        | 70.40                          | 2.20                       | 89.10                     | 4.30                  | 7.90                         | 66.70                          |
| Corn Cob .....                                         | 0.50                  | 2.40                         | 54.90                          | 30.10                      | 89.30                     | 0.30                  | 0.40                         | 52.50                          |
| Corn and Cob Meal .....                                | 3.50                  | 8.50                         | 64.80                          | 6.60                       | 84.90                     | 2.90                  | 4.40                         | 60.00                          |
| Corn Bran .....                                        | 5.80                  | 9.00                         | 62.20                          | 12.70                      | 90.90                     | 4.60                  | 7.40                         | 59.80                          |
| Gluten Meal .....                                      | 11.80                 | 29.30                        | 46.50                          | 3.30                       | 91.80                     | 11.00                 | 25.80                        | 43.30                          |
| Hominy Chop .....                                      | 8.30                  | 9.80                         | 64.50                          | 3.80                       | 88.90                     | 6.80                  | 7.50                         | 55.20                          |
| Germ Meal .....                                        | 7.10                  | 11.10                        | 62.50                          | 9.90                       | 89.60                     | 6.20                  | 9.00                         | 61.20                          |
| Wheat .....                                            | 2.10                  | 11.90                        | 71.90                          | 1.80                       | 89.50                     | 1.70                  | 10.20                        | 69.20                          |
| Low Grade Flour .....                                  | 3.90                  | 18.00                        | 63.30                          | 0.90                       | 87.60                     | 0.90                  | 8.20                         | 62.70                          |
| Wheat Bran .....                                       | 4.00                  | 15.40                        | 53.90                          | 9.00                       | 88.10                     | 2.70                  | 12.20                        | 39.20                          |
| Wheat Shorts .....                                     | 4.50                  | 14.90                        | 56.80                          | 7.40                       | 88.20                     | 3.80                  | 12.20                        | 50.00                          |
| Wheat Middlings .....                                  | 4.00                  | 15.60                        | 60.40                          | 4.60                       | 87.90                     | 3.40                  | 12.80                        | 53.00                          |
| Wheat Screenings .....                                 | 3.00                  | 12.50                        | 65.10                          | 4.90                       | 88.40                     | 2.20                  | 9.80                         | 51.00                          |
| Malt Sprouts .....                                     | 1.70                  | 23.20                        | 48.50                          | 10.70                      | 89.80                     | 1.70                  | 18.60                        | 37.10                          |
| Dried Brewers' Grain .....                             | 5.60                  | 19.90                        | 51.70                          | 11.00                      | 91.80                     | 5.10                  | 15.70                        | 36.30                          |
| Oats .....                                             | 5.00                  | 11.80                        | 59.70                          | 9.50                       | 89.00                     | 4.20                  | 9.20                         | 47.30                          |
| Oat Shorts .....                                       | 7.10                  | 16.00                        | 59.40                          | 6.10                       | 92.30                     | 2.80                  | 12.50                        | 46.90                          |
| Oat Dust .....                                         | 4.80                  | 13.50                        | 50.20                          | 18.20                      | 93.50                     | 5.10                  | 8.90                         | 38.40                          |
| Oat Hulls .....                                        | 1.00                  | 3.30                         | 52.10                          | 29.70                      | 90.60                     | 0.60                  | 1.30                         | 40.10                          |
| Rice Bran .....                                        | 8.80                  | 12.10                        | 49.90                          | 9.50                       | 90.30                     | 7.30                  | 5.30                         | 45.10                          |
| Rice Polish .....                                      | 7.30                  | 11.70                        | 58.00                          | 6.30                       | 90.00                     | 6.50                  | 9.00                         | 56.40                          |
| Rice Hulls .....                                       | 0.70                  | 3.60                         | 38.60                          | 35.70                      | 91.80                     | 0.60                  | 1.60                         | 44.50                          |
| Buckwheat Bran .....                                   | 3.30                  | 12.40                        | 38.80                          | 31.90                      | 89.50                     | 1.90                  | 7.40                         | 30.40                          |
| Buckwheat Shorts .....                                 | 7.60                  | 27.10                        | 40.80                          | 8.30                       | 88.90                     | 5.50                  | 21.10                        | 33.50                          |
| Buckwheat Middlings .....                              | 7.10                  | 28.90                        | 41.90                          | 4.10                       | 87.30                     | 5.40                  | 22.00                        | 33.40                          |
| Buckwheat Hulls .....                                  | 1.10                  | 4.60                         | 35.30                          | 43.50                      | 86.80                     | 0.60                  | 2.10                         | 27.90                          |
| Cotton-Seed .....                                      | 19.90                 | 18.40                        | 24.70                          | 23.20                      | 89.70                     | 17.30                 | 12.50                        | 30.00                          |
| Cotton-seed Meal .....                                 | 8.00                  | 42.30                        | 25.10                          | 5.60                       | 91.80                     | 7.50                  | 37.20                        | 16.90                          |
| †Cotton-seed Hulls(when<br>fed with meal 4 to 1) ..... | 2.20                  | 4.20                         | 33.40                          | 46.30                      | 89.87                     | 1.73                  | 1.51                         | 39.90                          |
| Peas .....                                             | 1.40                  | 20.80                        | 55.70                          | 4.10                       | 89.50                     | .70                   | 16.80                        | 51.80                          |
| Soja Beans .....                                       | 16.90                 | 34.00                        | 28.80                          | 4.80                       | 89.20                     | 14.40                 | 29.60                        | 22.30                          |
| <b>Hays and Straws, etc.</b>                           |                       |                              |                                |                            |                           |                       |                              |                                |
| Timothy Hay .....                                      | 2.50                  | 5.90                         | 45.00                          | 29.00                      | 86.80                     | 1.40                  | 2.80                         | 43.40                          |
| Johnson Grass .....                                    |                       |                              |                                |                            | 85.70                     | 1.20                  | 6.00                         | 41.40                          |
| Mixed Hay .....                                        | 2.50                  | 7.40                         | 42.10                          | 27.20                      | 87.10                     | 1.20                  | 5.90                         | 40.90                          |
| Oat Hay .....                                          | 2.30                  | 9.30                         | 39.00                          | 29.20                      | 91.10                     | 1.50                  | 4.30                         | 46.40                          |
| Oat Straw .....                                        | 2.30                  | 4.00                         | 42.40                          | 37.00                      | 90.80                     | 0.80                  | 1.20                         | 38.60                          |
| Red Clover Hay .....                                   | 3.30                  | 12.30                        | 38.10                          | 24.80                      | 84.70                     | 1.70                  | 6.80                         | 35.80                          |
| White Clover Hay .....                                 | 2.90                  | 15.70                        | 39.30                          | 24.10                      | 90.30                     | 1.50                  | 11.50                        | 42.20                          |
| Crimson Clover Hay .....                               | 2.80                  | 15.20                        | 36.60                          | 27.20                      | 90.40                     | 1.20                  | 10.50                        | 34.90                          |
| Peanut Hay .....                                       |                       |                              |                                |                            | 92.40                     | 3.40                  | 6.70                         | 42.10                          |
| Alfalfa Hay .....                                      | 2.20                  | 14.30                        | 42.70                          | 25.00                      | 91.60                     | 1.20                  | 11.00                        | 39.60                          |
| Cowpea Hay .....                                       | 2.20                  | 16.60                        | 42.20                          | 20.10                      | 89.30                     | 1.10                  | 10.80                        | 38.60                          |
| Corn Silage .....                                      | 0.80                  | 1.70                         | 11.00                          | 6.00                       | 20.90                     | 0.70                  | 0.90                         | 11.30                          |
| Acorns, fresh .....                                    | 1.90                  | 2.50                         | 34.80                          | 4.40                       | 44.70                     | 1.70                  | 2.10                         | 34.40                          |

\* Figures from Henry's Feeds and Feeding.

† Computed from digestion co-efficients in Bul. 33, office of Exp. Stations, U. S. Dept. Agr., p. 387.

### Further Concerning Feeding Stuff Nutrients.

In the foregoing discussion, the composition of animals, the source, digestibility, and composition of the more important commercial feed materials; and the functions of feeding stuff nutrients have been reviewed in a brief elementary way. At this point it is not inappropriate to direct especial attention to the two most important functions of the nutrients in feeds, viz.:

- (1) To repair waste, i. e., the wear of the working parts of the body.
- (2) To supply heat and energy.

(1) **Repair of waste**, etc.—The working parts of the animal organism consist most largely of protein compounds, and the food must contain a sufficient supply of these to maintain the machinery of the animal in the best possible conditions, since the animal itself possesses no power of building up protein bodies from the non-protein constituents of the feed. The protein in feeds is their most expensive nutrient, and an over-supply is wasteful consequently, while a deficiency is certain to bring about undesirable results. Growing animals are constantly storing up large quantities of protein and dairy cows demand a constant supply of it for milk production.

(2) **Heat and Energy**.—The fat and carbohydrates supply the heat and energy. In absence of sufficient amounts of these, the protein may be drawn upon; but, as already pointed out, this is most often unwise and uneconomical. The quantity of heat produced by almost all kinds of feeding stuffs has been determined with great care and the results have been employed in computing rations\*

**Balanced rations**.—It is plain that different animals and the same animals kept for different purposes will not require identical amounts of protein (for building and keeping in repair the working parts of the body) and the fat and carbohydrates (for supplying heat and energy) in their daily rations. When these nutrients are properly correlated in a feed for a given animal, the ration is said to be "balanced."

It is obviously difficult to state precisely how much protein, fat, and carbohydrates should be fed daily to a work ox, for example. Even if positive information were at hand, it is certain that the amounts of these nutrients should be varied in the case of a young and rapidly growing animal or for a profitable milk cow. This is the very information, however, which the feeder requires, and, in absence of exact knowledge, the results of many careful experiments

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\* Farmers' Bul. 346, U. S. Dept. Agr.

must serve as the best guide to a rational feeding practice, as explained in succeeding paragraphs.

**Nutritive Ratio.**—In view of the fact that protein in a feed performs a function in the nutrition of animals differing widely from that of the fat and carbohydrates, the ratio of the amount of digestible protein to the digestible carbohydrates and fat, presents in a condensed way an idea of the character of the feed. This ratio is known as the "Nutritive Ratio." Since the animal draws mainly upon the fat and carbohydrates for heat and energy, it must be recalled here that one pound of fat will supply approximately  $2\frac{1}{4}$  times as much heat as one pound of carbohydrates. Consequently, in computing nutritive ratios, the fat is multiplied by  $2\frac{1}{4}$  and added to the amount of carbohydrates. An example will illustrate this clearly.

If we wish to compute the nutritive ratio of corn, we refer to the table on page — and find that it contains (in 100 lbs.) **digestible** nutrients as follows: Protein 7.90 lbs., fat 4.30 lbs., carbohydrates 66.70 lbs.

The nutritive ratio, is, therefore, as follows:

7.90 protein :  $(4.30 \times 2\frac{1}{4}) + 66.70$  equals ratio of 7.90 : 75.37 lbs., and, dividing both terms by 7.90 for convenience of expression, we have 1 : 9.5 which is the nutritive ratio.

The ratio for all feeds are similarly computed. The nutritive ratio of corn is rather "**wide**," that is to say, the fat and carbohydrates preponderate, while the ratio of cotton-seed meal, for example, is exceptionally "**narrow**", viz.: About 1 : 1.20, from which it is apparent that it is a feeding stuff of entirely different character.

**Feeding standards.**—Since we are not in possession of information which would enable us to compute without error the amount of each nutrient which an animal kept under certain conditions should receive daily, we must turn to the experience of practical feeders and the experiments of trained investigators for general directions in preparing feeds for various kinds of animals.

Practical experience and the results of experiments have been brought together in so-called feeding standards. No claim is set up for absolute accuracy in these standards which are simply intended to present the best conclusions available concerning the quantity of dry matter and the amount of each nutrient which a given animal kept for a specific purpose should receive each day. The standards first proposed by Wolff and later modified by Lehmann and known as the Wolff-Lehmann Standards have been widely used. Some investigators in animal nutrition prefer to modify these to some extent, but the data in the table below will serve our purpose, since these rations are to be viewed as suggestions which may be modified when circumstances make this necessary or advisable.



(Showing amounts of nutrients and total dry matter for each 1,000 lbs. live weight per head and per day.)

| ANIMAL                         | Total<br>dry<br>matter | Digestible Nutrients |                         |       | Nutritive<br>Ratio |          |
|--------------------------------|------------------------|----------------------|-------------------------|-------|--------------------|----------|
|                                |                        | Pro-<br>tein         | Carbo-<br>hy-<br>drates | Fat   |                    |          |
|                                | LBS.                   | LBS.                 | LBS.                    | LBS.  |                    |          |
| OXEN:                          |                        |                      |                         |       |                    |          |
| When at rest in stall .....    | 18                     | 0.70                 | 8.00                    | 0.10  | 1 : 11.80          |          |
| When at medium work .....      | 25                     | 2.00                 | 11.50                   | 0.50  | 1 : 6.50           |          |
| When at heavy work .....       | 28                     | 2.80                 | 13.00                   | 0.80  | 1 : 5.30           |          |
| HORSES:                        |                        |                      |                         |       |                    |          |
| When at medium work .....      | 24                     | 2.00                 | 11.00                   | 0.60  | 1 : 6.20           |          |
| When at heavy work .....       | 26                     | 2.50                 | 13.30                   | 0.80  | 1 : 6.00           |          |
| MILK Cows when yielding daily: |                        |                      |                         |       |                    |          |
| 11 lbs. of milk .....          | 25                     | 1.60                 | 10.00                   | 0.30  | 1 : 6.70           |          |
| 16.60 lbs. of milk .....       | 27                     | 2.00                 | 11.00                   | 0.40  | 1 : 6.00           |          |
| 22.00 lbs. of milk .....       | 29                     | 2.50                 | 13.00                   | 0.50  | 1 : 5.70           |          |
| 27.50 lbs. of milk .....       | 32                     | 3.30                 | 13.00                   | 0.80  | 1 : 4.50           |          |
| FATTENING CATTLE:              |                        |                      |                         |       |                    |          |
| First period .....             | 30                     | 2.50                 | 15.00                   | 0.50  | 1 : 6.50           |          |
| Second period .....            | 30                     | 3.00                 | 14.50                   | 0.70  | 1 : 5.40           |          |
| Third period .....             | 26                     | 2.70                 | 15.00                   | 0.70  | 1 : 6.20           |          |
| FATTENING SHEEP:               |                        |                      |                         |       |                    |          |
| First period .....             | 30                     | 3.00                 | 15.00                   | 0.50  | 1 : 5.40           |          |
| Second period .....            | 28                     | 3.50                 | 14.50                   | 0.60  | 1 : 4.50           |          |
| FATTENING SWINE:               |                        |                      |                         |       |                    |          |
| First period .....             | 36                     | 4.50                 | 25.00                   | 0.70  | 1 : 5.90           |          |
| Second period .....            | 32                     | 4.00                 | 24.00                   | 0.50  | 1 : 6.30           |          |
| Third period .....             | 25                     | 2.70                 | 18.00                   | 0.40  | 1 : 7.00           |          |
| GROWING CATTLE, Dairy breeds:  |                        |                      |                         |       |                    |          |
| AGE IN MOS.                    |                        | AVERAGE LIVE WT. .   |                         |       |                    |          |
| PER HEAD.                      |                        |                      |                         |       |                    |          |
| 2-3                            | 150 lbs.               | 23                   | 4.00                    | 13.00 | 2.00               | 1 : 4.50 |
| 3-6                            | 300 lbs.               | 24                   | 3.00                    | 12.80 | 1.00               | 1 : 5.10 |
| 6-12                           | 500 lbs.               | 27                   | 2.00                    | 12.50 | 0.50               | 1 : 6.80 |
| 12-18                          | 700 lbs.               | 26                   | 1.80                    | 12.50 | 0.40               | 1 : 7.50 |
| 18-24                          | 900 lbs.               | 26                   | 1.50                    | 12.00 | 0.30               | 1 : 8.50 |
| GROWING, FATTENING SWINE:      |                        |                      |                         |       |                    |          |
| AGE IN MOS.                    |                        | AVERAGE LIVE WT. .   |                         |       |                    |          |
| PER HEAD.                      |                        |                      |                         |       |                    |          |
| 2-3                            | 50 lbs.                | 44                   | 7.60                    | 28.00 | 1.00               | 1 : 4.00 |
| 3-5                            | 100 lbs.               | 35                   | 5.00                    | 23.00 | 0.80               | 1 : 5.00 |
| 5-6                            | 150 lbs.               | 33                   | 4.30                    | 22.30 | 0.60               | 1 : 5.50 |
| 6-8                            | 200 lbs.               | 30                   | 3.60                    | 20.50 | 0.40               | 1 : 6.00 |
| 9-12                           | 300 lbs.               | 26                   | 3.00                    | 18.30 | 0.30               | 1 : 6.40 |

\* Henry's Feeds and Feeding, p. 636.



**COMPUTATION OF RATIONS.**

Farmers and feeders generally cannot be urged too strongly to familiarize themselves thoroughly with the simple methods of computing rations; for it is plain that this is absolutely necessary for intelligent feeding. These calculations will also foster a spirit of inquiry concerning the composition and digestibility of feeds and the basic principles underlying the best practice. It cannot be denied that a more economical management is certain to follow a thorough understanding of these elementary principles of animal nutrition.

**An illustration.**—If we wish to prepare a ration for a dairy cow weighing approximately 1,000 lbs., giving, say 22 pounds of milk daily, a reference to the table of feeding standards will show that the feed should contain at least approximately:

|                     |            |
|---------------------|------------|
| Dry matter .....    | 29.00 lbs. |
| Fat .....           | 0.50 lbs.  |
| Protein.....        | 2.50 lbs.  |
| Carbohydrates ..... | 13.00 lbs. |

Certain feeding stuffs are available. The amounts of digestible nutrients in them will be found in the table on page 25. The feeder may have hays, silage, corn, etc., which have been produced on the farm. In any case, however, it is desired to supply the above nutrients in the cheapest materials that will make a palatable feed adapted to the animal. If market prices are favorable, the feeding standard may be approximated by a ration consisting of 25 lbs. of mixed hay, 3 lbs. of corn meal, and 3 lbs. of cotton-seed meal; for by reference to the table on page 25, showing digestible nutrients it will be found that:

|                                | <b>100 lbs. Mixed<br/>Hay Contains:</b> | <b>25 lbs. Mixed<br/>Hay contains:</b> |
|--------------------------------|-----------------------------------------|----------------------------------------|
| Digestible dry matter .....    | 87.10 lbs.                              | 21.77 lbs.                             |
| Digestible fat .....           | 1.20 lbs.                               | 0.30 lbs.                              |
| Digestible protein .....       | 5.90 lbs.                               | 1.47 lbs.                              |
| Digestible carbohydrates ..... | 40.90 lbs.                              | 10.22 lbs.                             |

|                                | <b>100 lbs. Corn<br/>Meal contains:</b> | <b>3 lbs. Corn Meal<br/>contains:</b> |
|--------------------------------|-----------------------------------------|---------------------------------------|
| Digestible dry matter .....    | 89.10 lbs.                              | 2.17 lbs.                             |
| Digestible fat .....           | 4.30 lbs.                               | 0.13 lbs.                             |
| Digestible protein .....       | 7.90 lbs.                               | 0.24 lbs.                             |
| Digestible carbohydrates ..... | 66.70 lbs.                              | 2.00 lbs.                             |

While

|                                | 100 lbs. Cotton-seed Meal contains: | 3 lbs. Cotton-seed Meal contains: |
|--------------------------------|-------------------------------------|-----------------------------------|
| Digestible dry matter .....    | 91.80 lbs.                          | 2.75 lbs.                         |
| Digestible fat .....           | 7.50 lbs.                           | 0.22 lbs.                         |
| Digestible protein .....       | 37.20 lb.                           | 1.11 lbs.                         |
| Digestible carbohydrates ..... | 16.90 lbs.                          | 0.51 lbs.                         |

And, hence, bringing the above results together, we find the three components of the ration to contain nutrients as follows:

| COMPONENTS OF THE<br>RATION.                    | Total<br>Dry<br>Matter | DIGESTIBLE NUTRIENTS |         |                    | Nutritive<br>Ratio |
|-------------------------------------------------|------------------------|----------------------|---------|--------------------|--------------------|
|                                                 |                        | Fat .                | Protein | Carbohy-<br>drates |                    |
|                                                 | LBS.                   | LBS.                 | LBS.    | LBS.               |                    |
| 25 lbs. Mixed Hay .....                         | 21.77                  | 0.30                 | 1.47    | 10.22              |                    |
| 3 lbs. Corn Meal .....                          | 2.67                   | 0.13                 | 0.24    | 2.00               |                    |
| 3 lbs. C.-S. Meal .....                         | 2.75                   | 0.22                 | 1.11    | 0.51               |                    |
| Totals .....                                    | 27.19                  | 0.65                 | 2.82    | 13.73              | 1 : 5.3            |
| But the Standard Ration<br>should contain ..... | 29.00                  | 0.50                 | 2.50    | 13.00              | 1 : 5.7            |

The ration conforms reasonably well with that suggested in the Wolff-Lehmann standard. These feeding stuffs were selected merely to illustrate a method of computing rations. The large amount of hay could be replaced in part by silage to advantage, and, since corn is so high just at this time, the ration could be cheapened somewhat by replacing it in large part by wheat bran of good quality.

In this state cotton-seed meal is such a cheap source of protein that a somewhat greater amount of protein than demanded by feeding standards may be used often to advantage.

Within reasonable limits also, an excess of fat will provide against a small deficiency of carbohydrates, and protein in excess of that demanded for building tissue will be employed by the animal for the production of heat and energy, functions usually most economically fulfilled by fat and carbohydrates.

In few words, therefore, these standards supply a valuable guide in feeding farm animals, and they can be made of the greatest value in avoiding haphazard, and oftentimes unwise and expensive methods of feeding.

Every intelligent feeder must study the standards and become thoroughly familiar with the computations of rations for all kinds of animals. An understanding of these matters is certainly demanded also on the part of those who are accustomed to buy ready mixed commercial feeds.

### **Suggestions Concerning the Purchase of Feeds.**

All feeding stuffs and mixed feeds should be purchased under guarantee. The amount of the nutrients guaranteed in all kinds of feeds sold in this state will be found stencilled on the bags or printed on cards attached to the bags, and a careful inspection of guaranty should never be omitted.

These feeds are bought for the digestible nutrients which they contain in palatable condition, and, if the guaranties or published analyses are not compared with the selling prices, purchasers will doubtless find that they are infrequently pay as much, or even more, for a feed of rather indifferent quality (i. e., low percentages of nutrients) as would be demanded for a feed containing in 100 lbs. a greater amount of nutrient substances. Therefore, the buyer must always assure himself of the **proper relation between the selling price and the composition of the feed.**

High percentages of fat and protein mean usually high feeding value, and these constituents are those most expensive to the manufacturer. The more concentrated feeding stuffs cannot carry high percentages of fiber, and this is also by far the most indigestible portion of the feed, and products containing a great deal of it, e. g., hays, straws, hulls of grain, etc., are cheap as compared with such concentrates, as cotton-seed meal, wheat bran, shorts, rice bran and polish, linseed meal, brewers' grains, gluten feeds, etc.

It is only by constant reference to guaranteed analyses or to the analyses in these publications that a feeder may feel assured always that he does not pay as much for a low grade as for a higher grade product.

### **Free Analyses of Feeds.**

The Department is always glad to co-operate in every possible way with purchasers of commercial feeds, and analyses of properly certified samples will be made without cost. It is obviously necessary, however, for these samples to be drawn in presence of witnesses and in accordance also with directions which have been prepared. Special forms for making out proper certificates will be furnished promptly on request.



### **So-Called Condimental, Tonic, and Medicinal Feeds.**

Extravagant and absurd claims are commonly made for feeds of this class which are usually sold in small packages. As compared with the price asked for them, they possess practically no nutritive value, and it is waste of money to buy them.

Manufacturers of these feeds sometimes seek to avoid having their product inspected, by representing them as medicines, or tonics, or relishes, etc. If, however, they have been heretofore sold or represented as foods, or feeds, such materials must be guaranteed, analyzed and inspected, unless it can be shown that they are no longer feeds within the meaning of the law now in force. In any event, it is safe to say that the purchase of these condimental stock and poultry foods, tonics, conditioners, etc., should be avoided.

### **Methods of Inspection.**

Feeding stuff inspectors are constantly on the road, and a large number of samples have been drawn. The more important centers of distribution naturally receive the especial attention of these inspectors, though samples are taken at practically every point in the state where feeds are sold in any considerable quantity.

Irregularities in the trade are promptly reported to manufacturers or sellers and brought to the attention of dealers also. Samples are being analyzed constantly and the results of these analyses are forwarded to the dealer, a copy being sent also to the manufacturer or guarantor. When the analysis shows a feed to be below the guaranty in any nutrient or sensibly above in crude fiber, the attention of the dealer and original shipper is especially directed to the deficiency, that similar errors may not be repeated in future shipments.

In case several analyses of inspectors' samples indicate adulteration, inspectors are instructed to notify dealers everywhere, that they may be on their guard, since the dealer is responsible under this law for the sale of fraudulent feeds.

Some brokers in Mobile and New Orleans have annoyed their customers greatly by frequent shipments of a few bags each of untagged or unregistered feed. These irregularities have been confined principally to points along or near the coast. Dealers in this district must inspect consignments which they receive from irresponsible brokers, because feed that is not properly guaranteed for the protection of the purchaser or which is adulterated must not be offered for sale in this state.



Every effort has been made to bring this law to the attention of the trade generally, and, while petty infractions of it are becoming less frequent, there now remains little reason for failure to comply with all of the simple requirements of the law.

**Co-operation of shippers.**—It is only just to state that shippers generally are supporting the administration of the law, and their co-operation in the interest of fair dealing and pure feeds will be of the greatest assistance in bringing about a better understanding of the composition and relative value of feeding stuffs which are now sold in such large quantities.

It is the purpose of the Department to carry out the inspection with no interference with the convenience of the trade, and every possible assistance will be given manufacturers who wish to market meritorious feeds in this state. It will be generally admitted that some system of inspection for the protection of buyers, and of manufacturers of high grade products has been made imperatively necessary by the appearance of low grade mixed feeds and adulterated by-products.

#### TABLES OF ANALYSES.

**Table I.**—This table contains analyses of 317 samples all of which were drawn by regular inspectors. These analyses are accompanied also by the guaranties for each product or brand name.

The results are important enough to receive the careful consideration of those who purchase feeding stuffs. For the present, merchants especially, should study them with the view of ascertaining whether they cannot buy better feeds at the same price they are now paying for brands which they handle. **The relative prices of feeds must be regulated by the digestible nutrients which they contain.** The analyses supply information upon which feeding stuffs should be bought. Those feeds highest in fat and protein are most expensive, and these are also the most valuable from the standpoint of the feeder.

Some of these analyses bring to light deficiencies in nutrients which must be corrected. In a number of instances manufacturers shipping into this state appeared to know little of the composition of their products, and guaranties filed by them failed to leave a safe margin for unavoidable variations. As the inspection progresses, additional results will be published and each manufacturer or shipper will have a record established for his products, and those supplying the highest grade feeds, as shown by these analyses, must inevitably attract and hold the greater part of the trade in this state.

**Table II---Corn Chops.**—The sale of pure corn chop is not affected by the law, but when adulterated with crushed cobs, or when mixed with any other material, such a mixture must be guaranteed and inspected. Chop carrying an adulterant of any kind must be sold as “mixed chop.”

Samples of chop are being collected and examined whether guaranteed or not. Special shipments will be cheerfully inspected when adulteration is suspected. Adulteration by crushed cob is indicated at once by an increased percentage of fiber.

**Table III.**—All feeds which were found by analysis to be deficient in fat and protein (i. e., the sum of the fat and protein) to the extent of 10% are collected in this table. Those manufacturers having several samples which must be classified in this way will have their feeds inspected with especial care. Their attention has been drawn to the fact that they guarantee their feeds to be of better quality than they have supplied. The law provides a penalty for this, and if samples now being analyzed show no improvement after the warning which has been given, all certificates (see Sec. IV of law) will be promptly recalled and the penalties enforced. Makers of feed who have supplied our trade for years and who have given too little attention to the chemical composition of their feeds or feed products must be careful now to have analyses made from time to time to avoid errors.

The Department realizes that all mistakes cannot be avoided and an occasional low sample may be due to carelessness of manufacturers employes, but a number of deficient samples cannot be passed over in this way.

Especial attention should be directed to the adulterated bran sold by the Hardy Grain Co., of Union City, Tenn., and to the corn chops supplied by the Henry A. Klyce Co., of Dyersburg, Tenn. Dealers from whom these samples were drawn have been warned that these goods are grossly adulterated. The Department will send inspectors to draw samples which must be analyzed, and found fully up to guarantee before these feeds can be placed on sale with safety. The table contains analyses of other deficient samples, and a continuance of business depends upon the correction of these errors.

| Laboratory Number. | Name of Brand and Manufacturer.                                             | Where and from Whom Collected.                         |
|--------------------|-----------------------------------------------------------------------------|--------------------------------------------------------|
| 9493               | ABBEVILLE RICE MILL OFFICE,<br>Abbeville, La.<br>Rice Bran No. 1 .....      | C. Atkinson's Sons Co., Summit.....<br>Guarantee.....  |
| 10403              | ALFALFA FEED MILLS,<br>Nashville, Tenn.<br>Mixed Middlings .....            | Tom Lyle Grocery Co., Meridian.....<br>Guarantee.....  |
| 9494               | AMERICAN MILLING COMPANY,<br>Chicago, Ill.<br>Sucrene Dairy Feed .....      | Gulfport Grocery Co., Gulfport.....                    |
| 9495               | Sucrene Dairy Feed .....                                                    | Gulfport Grocery Co., Gulfport.....                    |
| 10404              | Sucrene Dairy Feed .....                                                    | Capitol Grocery Co., Jackson.....<br>Guarantee.....    |
| 9496               | Sucrene Horse & Mule Feed .....                                             | Gulfport Grocery Co., Gulfport.....                    |
| 9497               | Sucrene Horse & Mule Feed .....                                             | Gulfport Grocery Co., Gulfport.....                    |
| 10405              | Sucrene Horse & Mule Feed .....                                             | W. E. Laird, Hattiesburg.....<br>Guarantee.....        |
| 10406              | ARKADELPHIA MILLING Co.,<br>Arkadelphia, Ark.<br>Mixed Bran .....           | Queen City Feed Store, Meridian.....<br>Guarantee..... |
| 10407              | Shorts .....                                                                | Winner, Klein Co., Meridian.....<br>Guarantee.....     |
| 9542               | ARLINGTON ROLLER MILLS,<br>Arlington, Ky.<br>Feed .....                     | J. K. Dunn, McComb *.....                              |
| 9543               | Feed .....                                                                  | Barrett Grocery Co., Lexington*.....                   |
| 9498               | BALLARD & BALLARD COMPANY,<br>Louisville, Ky.<br>Ballard's Shipstuff .....  | Ford Bros. Co., Centerville.....                       |
| 9499               | Ballard's Shipstuff .....                                                   | Jackson Wallace Co., Kosciusko.....<br>Guarantee.....  |
| 9500               | C. BECKER MILLING COMPANY,<br>Red Bud, Ill.<br>Wheat Bran .....             | J. C. McLindon, Newton.....                            |
| 9501               | Wheat Bran .....                                                            | Donoghue & Dee, Columbus .....                         |
| 9502               | Wheat Shorts.....                                                           | Robertson & Co., Columbus.....                         |
| 9503               | Wheat Shorts.....                                                           | Donoghue & Dee, Columbus.....<br>Guarantee.....        |
| 9504               | MARCUS BERNHEIMER FLOUR<br>MILLS Co.,<br>St. Louis, Mo.<br>Wheat Bran ..... | Abrams Bros., Brookhaven.....<br>Guarantee.....        |

\* No guarantees submitted for this brand.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9493               | 10.12              | 9.80          | 10.89<br>10.00      | 11.81<br>10.00          | 53.23<br>35.00          | 4.15<br>12.00         |
| 10403              | 12.40              | 2.85          | 3.48<br>3.50        | 10.81<br>10.00          | 61.38<br>50.00          | 9.08<br>12.00         |
| 9494               | 11.65              | 7.99          | 5.76                | 17.06                   | 45.52                   | 12.02                 |
| 9495               | 10.22              | 7.46          | 4.79                | 16.88                   | 52.90                   | 7.75                  |
| 10404              | 11.19              | 7.80          | 5.56<br>3.50        | 16.94<br>16.50          | 47.01<br>48.54          | 11.50<br>12.00        |
| 9496               | 11.39              | 6.07          | 4.84                | 11.88                   | 56.51                   | 9.31                  |
| 9497               | 9.28               | 5.84          | 4.21                | 12.38                   | 57.93                   | 10.36                 |
| 10405              | 11.36              | 5.88          | 4.31<br>3.50        | 10.56<br>10.00          | 56.95<br>50.00          | 10.94<br>12.00        |
| 10406              | 10.31              | 6.23          | 3.51<br>4.02        | 12.38<br>15.00          | 57.10<br>52.89          | 10.47<br>8.88         |
| 10407              | 9.44               | 6.82          | 4.40<br>3.75        | 14.38<br>16.00          | 53.39<br>56.00          | 11.57<br>5.00         |
| 9542               | 10.40              | 6.33          | 5.13                | 15.56                   | 55.58                   | 7.00                  |
| 9543               | 9.21               | 6.39          | 4.84                | 15.44                   | 55.90                   | 8.22                  |
| 9498               | 10.59              | 4.79          | 5.21                | 15.81                   | 55.70                   | 7.90                  |
| 9499               | 10.05              | 4.85          | 5.10<br>3.75        | 15.31<br>15.69          | 56.13<br>55.00          | 8.56<br>6.87          |
| 9500               | 10.54              | 6.72          | 5.04                | 14.06                   | 51.99                   | 11.65                 |
| 9501               | 9.87               | 6.68          | 4.84<br>3.58        | 14.56<br>14.50          | 53.22<br>52.00          | 10.83<br>10.00        |
| 9502               | 10.72              | 4.62          | 6.15                | 13.63                   | 58.34                   | 6.54                  |
| 9503               | 10.85              | 4.46          | 5.73<br>4.20        | 13.63<br>15.50          | 58.48<br>60.80          | 6.85<br>3.70          |
| 9504               | 10.36              | 5.96          | 4.38<br>4.00        | 13.75<br>14.50          | 56.32<br>50.00          | 9.23<br>9.50          |



| Laboratory Number. | Name of Brand and Manufacturer.                                      | Where and from Whom Collected.                          |
|--------------------|----------------------------------------------------------------------|---------------------------------------------------------|
| 10408              | THE BLAIR MILLING COMPANY,<br>Atchison, Kans.<br>Bran .....          | Threefoot Bros. & Co., Meridian.....<br>Guarantee.....  |
| 10409              | BLOOM'S SONS COMPANY,<br>New Orleans, La.<br>Rice Polish .....       | W. M. Conner, Hattiesburg.....<br>Guarantee.....        |
| 9505               | BROWDER MILLING COMPANY,<br>Fulton, Ky.<br>Mixed Feed .....          | Wm. Atkinson & McDonald Co.,<br>Wesson .....            |
| 10411              | Mixed Feed .....                                                     | Blackston Merc. Co., Winona.....<br>Guarantee.....      |
| 10410              | E. C. BUCHANAN & COMPANY,<br>Memphis, Tenn.<br>Wheat Shorts.....     | C. M. Elder, New Albany.....<br>Guarantee.....          |
| 10412              | CAPE COUNTY MILLING CO.,<br>Jackson, Mo.<br>Wheat Bran .....         | W. O. Worrell, Vicksburg.....<br>Guarantee.....         |
| 10413              | Mixed Feed .....                                                     | Beaman & Co., Forest.....<br>Guarantee* .....           |
| 9506               | CAPITAL GRAIN & MILL CO.,<br>Nashville, Tenn.<br>Alfacorn Feed ..... | Hanes & Hood, Vicksburg.....                            |
| 10414              | Alfacorn Feed .....                                                  | E. W. Troutman, Long Beach.....                         |
| 10415              | Alfacorn Feed .....                                                  | Hood Milling Co., Gulfport.....<br>Guarantee.....       |
| 9507               | CHARLESTON MILLING CO.,<br>Charleston, Mo.<br>Bran .....             | S. P. Rimmer, Kosciusko.....                            |
| 9508               | Bran .....                                                           | Cohen & Feld, Vicksburg.....<br>Guarantee.....          |
| 9509               | Shipstuff .....                                                      | S. P. Rimmer, Kosciusko.....<br>Guarantee.....          |
| 10416              | H. C. COLE MILLING COMPANY,<br>Chester, Ill.<br>Wheat Bran .....     | S. Swartz & Co., Vicksburg.....<br>Guarantee.....       |
| 10417              | COLUMBIA STAR MILLING CO.,<br>Columbia, Ill.<br>Wheat Bran .....     | Macon Merc. Co., Macon.....<br>Guarantee.....           |
| 9510               | Corno Mills Company,<br>St. Louis, Mo.<br>Corno Chick Feed .....     | P. P. Williams Co., Vicksburg.....                      |
| 9511               | Corno Chick Feed .....                                               | Postlethwaite & Chase Co., Natchez...                   |
| 10418              | Corno Chick Feed .....                                               | Postlethwaite & Chase Co., Natchez...<br>Guarantee..... |

\* No guarantee submitted for this Brand.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein<br>Per Cent. | Carbohydrates<br>Per Cent. | Crude Fiber<br>Per Cent. |
|--------------------|--------------------|---------------|---------------------|----------------------------|----------------------------|--------------------------|
| 10408              | 10.88              | 6.89          | 4.42<br>3.60        | 15.44<br>14.00             | 53.13<br>54.00             | 9.24<br>9.50             |
| 10409              | 10.92              | 4.24          | 7.33<br>4.77        | 11.44<br>10.13             | 64.08<br>69.28             | 1.99<br>2.20             |
| 9505               | 9.62               | 6.03          | 5.02                | 15.88                      | 53.47                      | 9.98                     |
| 10411              | 10.40              | 5.48          | 4.65<br>5.00        | 16.06<br>17.00             | 56.45<br>55.70             | 6.96<br>7.00             |
| 10410              | 12.48              | 4.90          | 4.74<br>4.00        | 18.94<br>16.50             | 54.44<br>52.00             | 4.50<br>6.00             |
| 10412              | 11.46              | 5.30          | 4.43<br>3.50        | 15.44<br>11.50             | 55.59<br>52.90             | 7.78<br>9.00             |
| 10413              | 12.25              | 5.56          | 4.26                | 15.88                      | 54.40                      | 7.65                     |
| 9506               | 9.57               | 4.54          | 2.65                | 15.56                      | 52.01                      | 15.67                    |
| 10414              | 12.07              | 4.37          | 2.84                | 10.44                      | 60.37                      | 9.91                     |
| 10415              | 12.50              | 3.65          | 3.31<br>3.50        | 10.13<br>12.00             | 60.50<br>54.00             | 9.91<br>12.00            |
| 9507               | 8.80               | 6.77          | 4.41                | 18.69                      | 54.79                      | 6.54                     |
| 9508               | 8.36               | 6.25          | 3.08<br>4.75        | 19.00<br>13.10             | 56.79<br>54.50             | 6.52<br>9.20             |
| 9509               | 8.55               | 4.61          | 5.41<br>5.20        | 20.13<br>14.35             | 57.36<br>60.20             | 3.94<br>4.50             |
| 10416              | 11.67              | 6.81          | 4.20<br>3.50        | 14.25<br>14.50             | 53.06<br>50.00             | 10.01<br>10.00           |
| 10417              | 10.07              | 6.92          | 4.62<br>3.74        | 15.25<br>15.26             | 53.42<br>53.38             | 9.72<br>9.21             |
| 9510               | 11.32              | 1.91          | 3.05                | 9.88                       | 71.32                      | 2.52                     |
| 9511               | 11.52              | 1.73          | 2.68                | 10.13                      | 71.58                      | 2.36                     |
| 10418              | 13.10              | 2.55          | 2.75<br>3.50        | 10.63<br>10.00             | 68.23<br>70.00             | 2.74<br>3.40             |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                 | Where and from Whom Collected.         |
|--------------------|-------------------------------------------------|----------------------------------------|
| 9512               | Corno Hen Feed .....                            | Crawford & Co., Greenville.....        |
| 9513               | Corno Hen Feed .....                            | Greenwood Grocery Co., Greenwood....   |
| 9514               | Corno Hen Feed .....                            | Barrett Grocery Co., Lexington.....    |
| 9515               | Corno Hen Feed .....                            | Postlethwaite & Chase Co., Natchez.... |
| 10419              | Corno Hen Feed .....                            | P. P. Williams Co., Vicksburg.....     |
|                    |                                                 | Guarantee.....                         |
| 9516               | Corno Horse & Mule Feed .....                   | Postlethwaite & Chase Co., Natchez.... |
| 9517               | Corno Horse & Mule Feed .....                   | J. L. Walker & Co., Columbus.....      |
| 9518               | Corno Horse & Mule Feed .....                   | Holloway & Holloway, Collins.....      |
| 9520               | Corno Horse & Mule Feed .....                   | E. M. Odom, Star.....                  |
| 9521               | Corno Horse & Mule Feed .....                   | Hannah Distributing Co., Jackson.....  |
| 9522               | Corno Horse & Mule Feed .....                   | Yazoo Grocery Co., Yazoo City.....     |
| 9523               | Corno Horse & Mule Feed .....                   | Crawford Grocery Co., Greenville.....  |
| 9524               | Corno Horse & Mule Feed .....                   | Greenwood Grocery Co., Greenwood....   |
| 9525               | Corno Horse & Mule Feed .....                   | Crawford Grocery Co., Greenville.....  |
| 9526               | Corno Horse & Mule Feed .....                   | Jackson-Wallace Co., Kosciusko.....    |
| 9527               | Corno Horse & Mule Feed .....                   | W. B. Potts & Sons, Kosciusko.....     |
| 9528               | Corno Horse & Mule Feed .....                   | Barrett Grocery Co., Lexington.....    |
| 9529               | Corno Horse & Mule Feed .....                   | Hannah Distributing Co., Jackson.....  |
| 9530               | Corno Horse & Mule Feed .....                   | P. P. Williams Co., Vicksburg.....     |
| 10420              | Corno Horse & Mule Feed .....                   | Gaddis & McLaurin Co., Raymond....     |
| 10421              | Corno Horse & Mule Feed .....                   | A. J. Lewis, Edwards .....             |
|                    |                                                 | Guarantee.....                         |
|                    | CUNNINGHAM COMMISSION Co.,<br>Little Rock, Ark. |                                        |
| 10422              | Pulaski Mixed Horse Feed .....                  | Hanes & Hood, Vicksburg.....           |
|                    |                                                 | Guarantee.....                         |
|                    | DAHNE-WALKER MILLING Co.,<br>Union City, Tenn.  |                                        |
| 9531               | Wheat Bran .....                                | Hattiesburg Grocery Co., Hattiesburg   |
| 9532               | Wheat Bran .....                                | Meyer Bros., Meridian.....             |
|                    |                                                 | Guarantee.....                         |
| 9533               | Wheat Shorts.....                               | Hattiesburg Grocery Co., Hattiesburg   |
| 10423              | Wheat Shorts.....                               | The Clark Grocery Co., Tupelo.....     |
|                    |                                                 | Guarantee.....                         |
|                    | DAVIS & ANDREWS COMPANY,<br>Memphis, Tenn.      |                                        |
| 9534               | Wheat Bran .....                                | The Goyer Company, Greenville.....     |
| 9535               | Wheat Bran .....                                | The Goyer Company, Greenville.....     |
|                    |                                                 | Guarantee.....                         |
|                    | DEAN MILL COMPANY,<br>Ava, Ill.                 |                                        |
| 10424              | Wheat Bran .....                                | J. L. Walker & Company, Columbus....   |
|                    |                                                 | Guarantee.....                         |
|                    | THE DUNLAP MILLING Co.,<br>Clarksville, Tenn.   |                                        |
| 9536               | Wheat Bran .....                                | Greenwood Grocery Co., Greenwood ...   |
| 10425              | Wheat Bran .....                                | Ball Merc. Co., Columbia.....          |
|                    |                                                 | Guarantee.....                         |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9512               | 13.31              | 1.51          | 3.24                | 9.69                    | 68.97                   | 3.28                  |
| 9513               | 12.28              | 1.61          | 3.25                | 10.50                   | 69.20                   | 3.16                  |
| 9514               | 12.35              | 1.60          | 3.13                | 10.44                   | 70.16                   | 2.32                  |
| 9515               | 12.31              | 1.58          | 3.09                | 10.44                   | 70.39                   | 2.19                  |
| 10419              | 11.63              | 1.45          | 3.94<br>3.70        | 11.13<br>10.00          | 69.64<br>70.00          | 2.21<br>2.30          |
| 9516               | 10.95              | 4.04          | 3.16                | 9.25                    | 56.68                   | 15.92                 |
| 9517               | 10.61              | 3.40          | 3.76                | 9.44                    | 59.25                   | 13.54                 |
| 9518               | 12.22              | 3.64          | 3.28                | 9.25                    | 56.85                   | 14.76                 |
| 9520               | 9.86               | 4.09          | 4.33                | 13.06                   | 52.97                   | 15.69                 |
| 9521               | 11.32              | 3.46          | 3.80                | 10.25                   | 57.94                   | 13.23                 |
| 9522               | 9.96               | 3.75          | 4.08                | 8.56                    | 59.47                   | 14.18                 |
| 9523               | 11.16              | 3.27          | 3.67                | 9.50                    | 57.83                   | 14.57                 |
| 9524               | 10.45              | 4.14          | 4.03                | 9.50                    | 58.43                   | 13.45                 |
| 9525               | 9.48               | 3.89          | 4.09                | 9.63                    | 58.17                   | 14.74                 |
| 9526               | 7.89               | 4.32          | 3.66                | 10.00                   | 58.05                   | 16.08                 |
| 9527               | 9.24               | 4.05          | 4.30                | 9.25                    | 63.33                   | 9.83                  |
| 9528               | 8.15               | 4.16          | 4.06                | 10.13                   | 58.24                   | 15.26                 |
| 9529               | 10.01              | 3.89          | 3.62                | 8.81                    | 59.59                   | 14.08                 |
| 9530               | 10.28              | 3.34          | 3.77                | 9.06                    | 59.92                   | 13.63                 |
| 10420              | 12.60              | 3.76          | 3.80                | 9.81                    | 56.21                   | 13.82                 |
| 10421              | 12.24              | 3.81          | 3.92<br>3.50        | 11.06<br>10.00          | 56.50<br>58.50          | 12.47<br>12.00        |
| 10422              | 11.43              | 7.71          | 5.59<br>4.00        | 12.31<br>12.00          | 51.87<br>55.00          | 11.09<br>12.00        |
| 9531               | 9.76               | 5.29          | 4.34                | 14.13                   | 57.90                   | 8.58                  |
| 9532               | 9.23               | 5.41          | 4.21<br>3.95        | 14.63<br>14.00          | 58.03<br>55.00          | 8.49<br>10.50         |
| 9533               | 9.89               | 3.69          | 4.17                | 14.19                   | 63.84                   | 4.22                  |
| 10423              | 13.17              | 3.78          | 4.51<br>4.85        | 14.69<br>13.75          | 58.15<br>62.00          | 5.70<br>7.50          |
| 9534               | 8.18               | 5.62          | 4.29                | 17.31                   | 57.33                   | 7.27                  |
| 9535               | 9.73               | 6.57          | 4.85<br>3.50        | 15.44<br>10.00          | 54.24<br>54.00          | 9.17<br>10.50         |
| 10424              | 11.17              | 6.20          | 3.89<br>3.50        | 13.63<br>14.00          | 56.11<br>54.00          | 9.00<br>10.00         |
| 9536               | 9.47               | 6.28          | 5.27                | 14.00                   | 55.42                   | 9.56                  |
| 10425              | 12.00              | 6.03          | 3.85<br>4.00        | 14.56<br>14.00          | 53.59<br>55.00          | 9.97<br>10.00         |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                 | Where and from Whom Collected.         |
|--------------------|-----------------------------------------------------------------|----------------------------------------|
|                    | J. B. EDGAR GRAIN COMPANY,<br>Memphis, Tenn.                    |                                        |
| 9537               | Ceralfa Stock Feed .....                                        | J. C. McLindon, Newton.....            |
| 9538               | Ceralfa Stock Feed .....                                        | R. L. Crook & Co., Vicksburg.....      |
| 10426              | Ceralfa Stock Feed .....                                        | W. H. Pritchard & Co., Natchez.....    |
|                    |                                                                 | Guarantee.....                         |
|                    | EGGERS MILLING COMPANY,<br>Hermann, Mo.                         |                                        |
| 9539               | Wheat Bran .....                                                | Becker, Lylè & McGrath Co., Wesson     |
| 9540               | Wheat Bran .....                                                | D. W. Wilkinson & Bro., Jackson.....   |
|                    |                                                                 | Guarantee.....                         |
|                    | FREEBURG MILLING COMPANY,<br>Freeburg, Ill.                     |                                        |
| 9544               | Bran .....                                                      | A. C. Seavey & Sons, Brookhaven .....  |
|                    |                                                                 | Guarantee.....                         |
| 10427              | Middlings .....                                                 | Foote-Patrick Co., Laurel .....        |
|                    |                                                                 | Guarantee.....                         |
|                    | FORKED DEER MILLING Co.,<br>Dyersburg, Tenn.                    |                                        |
| 10428              | Wheat Bran .....                                                | W. B. Potts & Sons, Kosciusko.....     |
|                    |                                                                 | Guarantee.....                         |
|                    | A. H. GEORGE & COMPANY,<br>Meridian, Miss.                      |                                        |
| 9339               | Prepared Cow and Cattle Feed .....                              | James Hand, Purvis.....                |
| 9545               | Prepared Cow and Cattle Feed .....                              | A. H. George & Co., Meridian.....      |
| 9839               | Prepared Cow and Cattle Feed .....                              | A. H. George & Co., Meridian.....      |
| 10429              | Prepared Cow and Cattle Feed .....                              | James Hand, Purvis.....                |
| 10615              | Prepared Cow and Cattle Feed .....                              | A. H. George & Co., Meridian.....      |
| 10616              | Prepared Cow and Cattle Feed .....                              | A. H. George & Co., Meridian.....      |
|                    |                                                                 | Guarantee.....                         |
| 9840               | Prepared Horse & Mule Feed .....                                | A. H. George & Co., Meridian.....      |
|                    |                                                                 | Guarantee.....                         |
|                    | J. T. GIBBONS,<br>New Orleans, La.                              |                                        |
| 10431              | Rice Polish .....                                               | Lotterhos & Huber Co., Crystal Sp'gs.  |
|                    |                                                                 | Guarantee.....                         |
| 10430              | Wheat Bran .....                                                | L. H. Weems, Ellisville.....           |
|                    |                                                                 | Guarantee.....                         |
|                    | B. F. GLOVER & SON COM-<br>MISSION COMPANY,<br>New Orleans, La. |                                        |
| 9546               | Wheat Bran .....                                                | D. Carver Merc. Co., Bay St. Louis.... |
| 9547               | Wheat Bran .....                                                | W. M. Canty, Scranton.....             |
|                    |                                                                 | Guarantee.....                         |
| 9548               | Wheat Shorts.....                                               | T. E. Winn, Laurel.....                |
| 10432              | Wheat Shorts.....                                               | Johnson-Hand Co., Ellisville.....      |
|                    |                                                                 | Guarantee.....                         |
| 10433              | Rice Bran .....                                                 | A. Scofide, Bay St. Louis.....         |
|                    |                                                                 | Guarantee.....                         |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9537               | 11.49              | 6.10          | 5.44                | 13.56                   | 51.76                   | 11.65                 |
| 9538               | 8.64               | 6.11          | 4.50                | 14.13                   | 55.95                   | 10.67                 |
| 10426              | 11.41              | 7.91          | 3.68                | 12.88                   | 55.05                   | 9.07                  |
|                    |                    |               | 4.50                | 14.00                   | 50.00                   | 11.50                 |
| 9539               | 9.87               | 6.04          | 4.72                | 16.00                   | 55.54                   | 7.83                  |
| 9540               | 9.87               | 6.17          | 4.95                | 16.00                   | 55.76                   | 7.25                  |
|                    |                    |               | 4.50                | 15.00                   | 54.00                   | 9.25                  |
| 9544               | 9.32               | 6.40          | 5.05                | 15.81                   | 55.28                   | 8.14                  |
|                    |                    |               | 3.50                | 14.00                   | 54.00                   | 9.50                  |
| 10427              | 11.97              | 2.78          | 3.62                | 14.88                   | 63.33                   | 3.42                  |
|                    |                    |               | 3.50                | 13.50                   | 55.00                   | 5.00                  |
| 10428              | 11.12              | 5.46          | 4.69                | 15.75                   | 56.93                   | 6.05                  |
|                    |                    |               | 3.79                | 15.47                   | 58.86                   | 7.27                  |
| 9339               | 6.06               | 4.35          | 4.09                | 9.44                    | 48.19                   | 27.87                 |
| 9545               | 2.67               | 3.99          | 4.04                | 10.44                   | 47.82                   | 31.04                 |
| 9839               | 8.32               | 4.42          | 4.65                | 10.13                   | 41.84                   | 30.64                 |
| 10429              | 9.00               | 4.14          | 4.26                | 9.81                    | 41.34                   | 31.45                 |
| 10615              | 9.28               | 3.56          | 3.93                | 11.75                   | 36.92                   | 34.56                 |
| 10616              | 9.38               | 4.16          | 4.96                | 13.44                   | 37.08                   | 30.98                 |
|                    |                    |               | 4.00                | 11.00                   | 38.00                   | 40.00                 |
| 9840               | 9.50               | 6.95          | 9.12                | 12.44                   | 52.79                   | 9.20                  |
|                    |                    |               | 4.00                | 12.00                   | 60.00                   | 4.63                  |
| 10431              | 11.15              | 5.13          | 9.70                | 11.56                   | 61.06                   | 1.40                  |
|                    |                    |               | 9.50                | 9.45                    | 63.00                   | 1.50                  |
| 10430              | 12.80              | 6.35          | 4.00                | 17.13                   | 50.83                   | 8.89                  |
|                    |                    |               | 3.75                | 13.00                   | 55.50                   | 10.00                 |
| 9546               | 9.65               | 5.12          | 3.85                | 13.06                   | 57.68                   | 10.64                 |
| 9547               | 9.00               | 5.19          | 3.42                | 13.31                   | 56.93                   | 12.15                 |
|                    |                    |               | 3.58                | 14.85                   | 54.60                   | 10.00                 |
| 9548               | 9.88               | 5.38          | 5.62                | 19.50                   | 53.27                   | 6.35                  |
| 10432              | 12.28              | 4.64          | 5.15                | 18.50                   | 53.20                   | 6.23                  |
|                    |                    |               | 4.50                | 14.90                   | 56.80                   | 7.40                  |
| 10433              | 11.23              | 8.06          | 11.18               | 12.13                   | 45.64                   | 11.76                 |
|                    |                    |               | 12.29               | 11.25                   | 41.88                   | 11.30                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                         |
|--------------------|----------------------------------------------------------|--------------------------------------------------------|
|                    | GOOD LUCK MILLS,<br>St. Louis, Mo.                       |                                                        |
| 9549               | Good Luck Alfalfa Feed .....                             | The Goyer Company, Greenville.....<br>Guarantee.....   |
| 10434              | Good Luck Feed .....                                     | The Goyer Company, Greenville.....<br>Guarantee.....   |
|                    | GREAT WESTERN CEREAL Co.,<br>Chicago, Ill.               |                                                        |
| 9550               | Boss Chop Feed .....                                     | B. J. Barrier Co., Yazoo City.....                     |
| 9551               | Boss Chop Feed .....                                     | Taylor-Wills Grocery Co., Jackson....                  |
| 10435              | Boss Chop Feed .....                                     | Yazoo Grocery Co., Yazoo City.....                     |
| 10436              | Boss Chop Feed .....                                     | Taylor-Wills Grocery Co., Jackson....                  |
| 10437              | Boss Chop Feed .....                                     | B. Kullman & Co., Natchez.....<br>Guarantee.....       |
| 10438              | Daisy Dairy Feed .....                                   | R. H. Green & Bro., Jackson.....                       |
| 10439              | Daisy Dairy Feed .....                                   | P. P. Williams Co., Vicksburg.....<br>Guarantee.....   |
| 10440              | Daisy Horse Feed .....                                   | R. H. Green & Bro., Jackson.....                       |
| 10441              | Daisy Horse Feed .....                                   | Merchants Grocery Co., Crystal Spgs.<br>Guarantee..... |
| 9552               | Durham Chop Feed .....                                   | I. Lowenberg & Co., Natchez.....                       |
| 10442              | Durham Chop Feed .....                                   | I. Lowenberg & Co., Natchez.....                       |
| 10443              | Durham Chop Feed .....                                   | I. Lowenberg & Co., Natchez.....<br>Guarantee.....     |
| 9326               | Excelsior Chop Feed.....                                 | Merchants Grocery Co., Crystal Sp'gs.                  |
| 9553               | Excelsior Chop Feed.....                                 | P. P. Williams Co., Vicksburg.....                     |
| 10444              | Excelsior Chop Feed.....                                 | P. P. Williams Co., Vicksburg.....                     |
| 10445              | Excelsior Chop Feed.....                                 | A. G. Russell Co., Vicksburg.....                      |
| 10446              | Excelsior Chop Feed.....                                 | C. J. Edwards Co., Vicksburg.....                      |
| 10447              | Excelsior Chop Feed.....                                 | The Clark Grocery Co., Tupelo.....<br>Guarantee.....   |
|                    | GREAT WESTERN FEED Co.,<br>St. Louis, Mo.                |                                                        |
| 10448              | Purity Horse and Cattle Feed .....                       | C. J. Searles & Co., Vicksburg.....<br>Guarantee.....  |
|                    | GULFPORT GRAIN & ELEVATOR<br>COMPANY,<br>Gulfport, Miss. |                                                        |
| 9554               | Home Mixed Feed .....                                    | Gulfport Grain & Elevator Co., G'port                  |
| 10451              | Home Mixed Feed .....                                    | J. K. Henley, Biloxi.....<br>Guarantee.....            |
|                    | GULFPORT GROCERY COMPANY,<br>Gulfport, Miss.             |                                                        |
| 9555               | Kreeme Cow and Cattle Feed ..                            | Gulfport Grocery Co., Gulfport.....<br>Guarantee.....  |
| 9335               | Nek Yok Ox Feed.....                                     | Gulfport Grocery Co., Gulfport.....                    |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9549               | 7.26               | 4.53          | 3.66<br><i>3.80</i> | 12.75<br><i>12.00</i>   | 64.78<br><i>58.00</i>   | 7.02<br><i>8.90</i>   |
| 10434              | 13.58              | 4.40          | 3.49<br><i>3.80</i> | 9.94<br><i>10.00</i>    | 57.61<br><i>59.20</i>   | 10.98<br><i>11.90</i> |
| 9550               | 7.86               | 4.62          | 5.31                | 9.00                    | 64.75                   | 8.46                  |
| 9551               | 7.36               | 4.23          | 5.01                | 8.13                    | 66.55                   | 8.72                  |
| 10435              | 9.85               | 4.31          | 4.40                | 8.31                    | 63.61                   | 9.52                  |
| 10436              | 11.30              | 1.97          | 2.93                | 8.63                    | 68.54                   | 6.63                  |
| 10437              | 9.79               | 5.75          | 4.51<br><i>4.00</i> | 11.69<br><i>9.50</i>    | 57.92<br><i>62.00</i>   | 10.34<br><i>10.00</i> |
| 10438              | 10.43              | 7.89          | 3.50                | 15.75                   | 51.25                   | 11.18                 |
| 10439              | 14.97              | 9.04          | 3.09<br><i>3.50</i> | 11.75<br><i>14.00</i>   | 50.93<br><i>60.00</i>   | 10.22<br><i>11.00</i> |
| 10440              | 9.71               | 7.47          | 3.70                | 17.00                   | 50.66                   | 11.46                 |
| 10441              | 7.77               | 8.15          | 3.48<br><i>3.50</i> | 14.56<br><i>12.00</i>   | 55.54<br><i>62.00</i>   | 10.50<br><i>11.00</i> |
| 9552               | 8.17               | 4.07          | 3.68                | 8.44                    | 64.82                   | 10.82                 |
| 10442              | 12.24              | 3.26          | 3.85                | 8.06                    | 64.49                   | 8.10                  |
| 10443              | 10.34              | 5.67          | 4.03<br><i>4.00</i> | 7.69<br><i>9.50</i>     | 62.23<br><i>62.00</i>   | 10.04<br><i>10.00</i> |
| 9326               | 10.78              | 3.35          | 4.54                | 8.81                    | 61.14                   | 11.38                 |
| 9553               | 8.90               | 3.73          | 4.76                | 8.44                    | 65.62                   | 8.55                  |
| 10444              | 9.54               | 4.93          | 3.85                | 8.13                    | 67.36                   | 6.19                  |
| 10445              | 10.28              | 4.04          | 4.71                | 8.38                    | 64.48                   | 8.11                  |
| 10446              | 9.77               | 4.86          | 4.72                | 8.25                    | 61.38                   | 11.02                 |
| 10447              | 10.16              | 4.47          | 4.67<br><i>4.00</i> | 9.19<br><i>9.50</i>     | 62.54<br><i>62.00</i>   | 8.97<br><i>10.00</i>  |
| 10448              | 10.23              | 5.30          | 4.22<br><i>4.00</i> | 11.38<br><i>11.50</i>   | 59.31<br><i>55.00</i>   | 9.56<br><i>10.00</i>  |
| 9554               | 9.85               | 5.29          | 4.19                | 16.88                   | 52.06                   | 11.73                 |
| 10451              | 10.85              | 4.78          | 3.59<br><i>3.50</i> | 12.19<br><i>10.00</i>   | 57.26<br><i>55.00</i>   | 11.33<br><i>12.00</i> |
| 9555               | 7.50               | 3.10          | 3.41<br><i>3.50</i> | 13.19<br><i>10.00</i>   | 56.54<br><i>50.00</i>   | 16.26<br><i>18.00</i> |
| 9335               | 8.23               | 3.10          | 4.30                | 11.13                   | 35.49                   | 37.75                 |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.               | Where and from Whom Collected.        |
|--------------------|-----------------------------------------------|---------------------------------------|
| 9556               | Nek Yok Ox Feed.....                          | Green Bros. Lumber Co., Baxterville   |
| 9557               | Nek Yok Ox Feed.....                          | Oakvale Lumber Co., Oakvale.....      |
| 9558               | Nek Yok Ox Feed.....                          | Gulfport Grocery Co., Gulfport.....   |
| 10449              | Nek Yok Ox Feed.....                          | Kennedy & Co., Wiggins.....           |
| 10450              | Nek Yok Ox Feed.....                          | Johnson-Woodward Co., Mt. Olive.....  |
|                    |                                               | Guarantee.....                        |
|                    | H. L. HOLLIDAY MILLING CO.,<br>Cairo, Ill.    |                                       |
| 9559               | Wheat Bran .....                              | Gulfport Grocery Co., Gulfport.....   |
| 10452              | Wheat Bran .....                              | Merchants Grocery Co., Hazlehurst...  |
| 10453              | Wheat Bran .....                              | J. K. Henley, Biloxi.....             |
|                    |                                               | Guarantee.....                        |
|                    | THE HANNAH DISTRIBUTING CO.<br>Jackson, Miss. |                                       |
| 9560               | Wheat Bran .....                              | Hannah Distributing Co., Jackson...   |
| 9561               | Wheat Bran .....                              | S. S. Stebbins & Co., McComb.....     |
|                    |                                               | Guarantee.....                        |
| 9562               | Mixed Feed (Bran and Shorts)                  | Hannah Distributing Co., Jackson...   |
|                    |                                               | Guarantee.....                        |
| 9563               | Mixed Feed .....                              | Hannah Distributing Co., Jackson..... |
| 9564               | Mixed Feed .....                              | Hannah Distributing Co., Jackson..... |
| 9565               | Mixed Feed .....                              | B. F. Youngblood & Co., Wesson.....   |
|                    |                                               | Guarantee.....                        |
| 9566               | Rice Polish .....                             | Hannah Distributing Co., Jackson..... |
|                    |                                               | Guarantee.....                        |
|                    | HARDY GRAIN COMPANY,<br>Union City, Tenn.     |                                       |
| 9567               | Mixed Feed Bran .....                         | Queen City F. & P. Co., Meridian..... |
| 9568               | Mixed Feed Bran .....                         | Winner Klein & Co., Meridian.....     |
| 9569               | Mixed Feed Bran .....                         | J. S. Allred, Hazlehurst.....         |
| 9570               | Mixed Feed Bran .....                         | Hattiesburg Grocery Co., Hattiesburg  |
| 9571               | Mixed Feed Bran .....                         | A. J. Lyons & Co., Meridian.....      |
| 10454              | Mixed Feed Bran .....                         | L. Funkenstein, Meridian.....         |
|                    |                                               | Guarantee.....                        |
| 9572               | Mixed Shorts .....                            | Queen City F. & P. Co., Meridian..... |
| 9573               | Mixed Shorts .....                            | A. J. Lyons & Co., Meridian.....      |
| 10455              | Mixed Shorts .....                            | Meyer Bros., Meridian.....            |
|                    |                                               | Guarantee.....                        |
|                    | HARRIS & COMPANY,<br>Meridian, Miss.          |                                       |
| 9336               | Tip Top Prepared Cattle Feed                  | James O'Connell, Purvis.....          |
| 9841               | Tip Top Prepared Cattle Feed                  | Harris & Co., Meridian.....           |
| 10456              | Tip Top Prepared Cattle Feed                  | Merchants Grocery Co., Hattiesburg... |
| 10665              | Tip Top Prepared Cattle Feed                  | The Lampton Co., Columbia.....        |
| 10666              | Tip Top Prepared Cattle Feed                  | Merchants Grocery Co., Hattiesburg... |
|                    |                                               | Guarantee.....                        |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9556               | 7.61               | 3.37          | 3.24                | 13.13                   | 54.65                   | 18.00                 |
| 9557               | 9.03               | 3.52          | 2.61                | 12.75                   | 53.24                   | 18.85                 |
| 9558               | 6.87               | 2.85          | 3.27                | 12.69                   | 56.72                   | 17.60                 |
| 10449              | 9.20               | 2.55          | 3.18                | 10.13                   | 54.11                   | 20.83                 |
| 10450              | 9.98               | 3.27          | 3.01                | 9.81                    | 52.98                   | 20.95                 |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 18.00                 |
| 9559               | 8.72               | 6.18          | 5.04                | 15.63                   | 55.93                   | 8.50                  |
| 10452              | 10.18              | 5.89          | 4.70                | 15.25                   | 56.08                   | 7.90                  |
| 10453              | 9.16               | 5.37          | 4.51                | 15.38                   | 57.57                   | 8.01                  |
|                    |                    |               | 4.00                | 14.00                   | 55.00                   | 8.50                  |
| 9560               | 8.29               | 6.87          | 4.90                | 16.50                   | 55.05                   | 8.39                  |
| 9561               | 8.00               | 5.31          | 4.44                | 15.44                   | 61.31                   | 5.50                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 12.00                 |
| 9562               | 7.88               | 5.79          | 4.68                | 16.19                   | 59.25                   | 6.21                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 12.00                 |
| 9563               | 9.83               | 4.56          | 4.89                | 17.06                   | 59.59                   | 4.07                  |
| 9564               | 8.65               | 5.32          | 4.58                | 16.19                   | 59.38                   | 5.88                  |
| 9565               | 10.19              | 4.13          | 4.85                | 17.50                   | 59.35                   | 3.98                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 12.00                 |
| 9566               | 10.04              | 5.81          | 8.75                | 11.06                   | 63.26                   | 1.08                  |
|                    |                    |               | 5.50                | 11.20                   | 52.00                   | 4.00                  |
| 9567               | 8.02               | 4.32          | 2.93                | 10.56                   | 57.15                   | 17.02                 |
| 9568               | 8.53               | 3.39          | 2.97                | 8.38                    | 56.71                   | 20.02                 |
| 9569               | 9.25               | 3.85          | 2.95                | 8.19                    | 55.66                   | 20.10                 |
| 9570               | 5.79               | 7.17          | 2.75                | 8.94                    | 55.37                   | 19.98                 |
| 9571               | 8.83               | 4.21          | 2.93                | 9.50                    | 55.93                   | 18.60                 |
| 10454              | 10.42              | 4.51          | 3.54                | 11.13                   | 64.89                   | 5.51                  |
|                    |                    |               | 4.00                | 12.01                   | 54.02                   | 6.61                  |
| 9572               | 8.86               | 3.68          | 4.11                | 13.50                   | 58.69                   | 11.16                 |
| 9573               | 9.29               | 4.01          | 4.24                | 14.63                   | 57.33                   | 10.50                 |
| 10455              | 11.47              | 3.34          | 3.78                | 13.50                   | 60.93                   | 6.98                  |
|                    |                    |               | 4.03                | 12.99                   | 60.71                   | 7.39                  |
| 9336               | 6.91               | 4.63          | 4.43                | 10.25                   | 32.76                   | 41.02                 |
| 9841               | 5.41               | 3.89          | 3.78                | 13.13                   | 42.65                   | 31.14                 |
| 10456              | 9.32               | 3.68          | 3.31                | 11.38                   | 42.90                   | 29.41                 |
| 10665              | 10.28              | 4.16          | 3.06                | 16.00                   | 35.43                   | 31.07                 |
| 10666              | 10.01              | 5.19          | 3.03                | 12.13                   | 34.78                   | 34.86                 |
|                    |                    |               | 3.50                | 12.50                   | 29.24                   | 33.81                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.         |
|--------------------|----------------------------------------------------------|----------------------------------------|
|                    | HUNTER BROS. MILLING Co.,<br>St. Louis, Mo.              |                                        |
| 9575               | Wheat Bran .....                                         | Union Naval Stores, Gulfport.....      |
| 9576               | Wheat Bran .....                                         | Hood Milling Co., Gulfport .....       |
| 9577               | Wheat Bran .....                                         | Gulfport Grocery Co., Gulfport .....   |
| 9578               | Wheat Bran .....                                         | C. J. Edwards Co., Vicksburg.....      |
|                    |                                                          | Guarantee.....                         |
| 9579               | Wheat Middlings .....                                    | Gulfport Grocery Co., Gulfport .....   |
|                    |                                                          | Guarantee.....                         |
|                    | ILLINOIS FEED MILLS,<br>St. Louis, Mo.                   |                                        |
| 9580               | Peck's Mule Feed .....                                   | Southern Commission Co., Greenville..  |
|                    |                                                          | Guarantee.....                         |
| 9581               | Star Feed .....                                          | G. W. Eggleston, Greenwood.....        |
| 9582               | Star Feed .....                                          | Rumble & Wensel, Natchez .....         |
| 9583               | Star Feed .....                                          | Delta Grocery & Cotton Co., Clarksdale |
| 9698               | Star Feed .....                                          | Rumble & Wensel, Natchez.....          |
|                    |                                                          | Guarantee.....                         |
|                    | KELLEY & LYSLE MILLING Co.,<br>Leavenworth, Kan.         |                                        |
| 10457              | Wheat Bran .....                                         | Conner Lumber Co., Seminary.....       |
|                    |                                                          | Guarantee.....                         |
| 10458              | Wheat Shorts .....                                       | J. B. Hughes, Stallo.....              |
|                    |                                                          | Guarantee.....                         |
|                    | KELLEY MILLING COMPANY,<br>Kansas City, Mo.              |                                        |
| 10459              | Wheat Shorts.....                                        | A. J. Lyons & Co., Meridian.....       |
|                    |                                                          | Guarantee.....                         |
|                    | KEMPER MILL & ELEVATOR Co.,<br>Kansas City, Mo.          |                                        |
| 9584               | Wheat Bran .....                                         | Hood Milling Co., Gulfport.....        |
| 10460              | Wheat Bran .....                                         | T. B. Gaddis, Morton.....              |
|                    |                                                          | Guarantee.....                         |
| 10461              | Crescent Shorts .....                                    | Baucum & Abney, Newton .....           |
|                    |                                                          | Guarantee.....                         |
|                    | KORNFALFA FEED MILLING Co.,<br>Kansas City, Mo.          |                                        |
| 10462              | Kornfalfa Feed .....                                     | Hannah Distributing Co., Jackson.....  |
|                    |                                                          | Guarantee.....                         |
|                    | LAWRENCE & HAMILTON FEED<br>COMPANY,<br>New Orleans, La. |                                        |
| 9325               | Stafolife .....                                          | Merchants Grocery Co., Crystal Sp'gs*  |
| 9594               | Stafolife .....                                          | A. F. Dantzer & Co., Moss Point.....   |
| 9595               | Stafolife .....                                          | W. M. Canty, Scranton.....             |
| 9596               | Stafolife .....                                          | W. A. McDonald, Bay St. Louis .....    |
| 9597               | Stafolife .....                                          | Guy Northrop, Pass Christian.....      |
| 9598               | Stafolife .....                                          | Hood Milling Co., Gulfport.....        |
| 9599               | Stafolife .....                                          | Foote-Patrick Co., Laurel.....         |
| 9600               | Stafolife .....                                          | A. Beer & Co., Natchez.....            |

\* Shipment returned to factory by Merchants Grocery Co.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9575               | 8.44               | 4.07          | 4.87                | 15.63                   | 57.73                   | 9.26                  |
| 9576               | 9.08               | 3.36          | 5.26                | 15.56                   | 58.44                   | 8.30                  |
| 9577               | 9.22               | 6.69          | 4.51                | 16.44                   | 54.66                   | 8.48                  |
| 9578               | 9.59               | 6.84          | 4.41                | 17.38                   | 52.61                   | 9.17                  |
|                    |                    |               | 3.50                | 14.00                   | 54.00                   | 10.00                 |
| 9579               | 8.12               | 3.77          | 4.14                | 15.81                   | 64.88                   | 3.48                  |
|                    |                    |               | 4.00                | 16.00                   | 56.00                   | 9.00                  |
| 9580               | 6.70               | 4.12          | 4.51                | 13.31                   | 66.89                   | 4.47                  |
|                    |                    |               | 3.80                | 10.00                   | 59.20                   | 11.90                 |
| 9581               | 9.32               | 3.05          | 3.93                | 12.63                   | 62.82                   | 8.25                  |
| 9582               | 9.23               | 3.39          | 3.83                | 12.69                   | 61.86                   | 9.00                  |
| 9583               | 9.64               | 4.68          | 4.38                | 13.00                   | 57.42                   | 10.88                 |
| 9698               | 6.18               | 4.54          | 5.31                | 12.75                   | 62.27                   | 8.95                  |
|                    |                    |               | 3.80                | 12.00                   | 58.00                   | 8.90                  |
| 10457              | 11.44              | 6.35          | 4.07                | 16.06                   | 53.21                   | 8.87                  |
|                    |                    |               | 4.00                | 15.00                   | 52.00                   | 10.00                 |
| 10458              | 9.02               | 4.60          | 5.17                | 17.69                   | 56.51                   | 7.01                  |
|                    |                    |               | 4.50                | 14.50                   | 54.00                   | 8.00                  |
| 10459              | 8.62               | 4.21          | 5.70                | 17.69                   | 59.26                   | 4.52                  |
|                    |                    |               | 4.50                | 17.00                   | 56.00                   | 5.00                  |
| 9584               | 8.83               | 7.12          | 4.57                | 16.56                   | 53.83                   | 9.09                  |
| 10460              | 8.93               | 7.28          | 3.75                | 16.13                   | 55.39                   | 8.52                  |
|                    |                    |               | 4.00                | 14.50                   | 53.50                   | 9.50                  |
| 10461              | 8.46               | 5.53          | 5.16                | 19.31                   | 53.05                   | 8.49                  |
|                    |                    |               | 4.25                | 16.00                   | 53.75                   | 8.00                  |
| 10462              | 10.71              | 4.46          | 3.43                | 14.13                   | 60.59                   | 6.68                  |
|                    |                    |               | 4.00                | 12.00                   | 58.00                   | 11.00                 |
| 9325               | 10.27              | 6.64          | 3.35                | 14.00                   | 50.28                   | 15.46                 |
| 9594               | 9.70               | 8.90          | 5.88                | 11.44                   | 59.07                   | 5.01                  |
| 9595               | 10.76              | 8.92          | 6.34                | 11.81                   | 56.03                   | 6.14                  |
| 9596               | 10.76              | 8.19          | 8.17                | 13.69                   | 52.55                   | 6.64                  |
| 9597               | 10.29              | 8.80          | 7.00                | 12.06                   | 57.26                   | 4.59                  |
| 9598               | 10.63              | 6.88          | 7.52                | 12.31                   | 57.58                   | 5.08                  |
| 9599               | 9.20               | 9.61          | 4.97                | 13.81                   | 50.05                   | 12.36                 |
| 9600               | 11.26              | 6.82          | 6.71                | 11.75                   | 56.88                   | 6.58                  |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                             | Where and from Whom Collected.                           |
|--------------------|-------------------------------------------------------------|----------------------------------------------------------|
| 9601               | Stafolife .....                                             | E. M. Carter, Centerville.....                           |
| 9602               | Stafolife .....                                             | P. P. Williams Co., Vicksburg.....                       |
| 9603               | Stafolife .....                                             | John McGrath & Sons, Brookhaven...                       |
| 9604               | Stafolife .....                                             | Parsons, May, Oberschmidt & Co.,<br>Brookhaven.....      |
| 9605               | Stafolife .....                                             | R. L. Crook & Co., Vicksburg.....                        |
| 9606               | Stafolife .....                                             | E. F. Elkins, Meridian.....                              |
| 9607               | Stafolife .....                                             | Merchants Grocery Co., Crystal Sp'gs.                    |
| 9608               | Stafolife .....                                             | Merchants Grocery Co., Hattiesburg....                   |
| 9609               | Stafolife .....                                             | Hood Milling Co., Gulfport.....                          |
| 9699               | Stafolife .....                                             | Merchants Grocery Co., Crystal Sp'gs<br>Guarantee.....   |
|                    | LIBERTY MILLS,<br>Nashville, Tenn.                          |                                                          |
| 9610               | Wheat Bran .....                                            | S. Cohn & Sons, Magnolia.....                            |
| 9611               | Wheat Bran .....                                            | Harris & Co., Meridian.....                              |
| 9612               | Wheat Bran .....                                            | Foote-Patrick Co., Laurel.....                           |
| 10463              | Wheat Bran .....                                            | J. L. Walker & Co., Columbus.....<br>Guarantee.....      |
| 9272               | Wheat Shorts.....                                           | The Lampton Co., Columbia.....                           |
| 9613               | Wheat Shorts.....                                           | Foote-Patrick Co., Laurel.....                           |
| 10464              | Wheat Shorts.....                                           | F. D. Carter, Aberdeen.....<br>Guarantee.....            |
|                    | LUKENS MILLING COMPANY,<br>Atchison, Kan.                   |                                                          |
| 9614               | Wheat Bran .....                                            | Taylor-Wills Grocery Co., Jackson....<br>Guarantee.....  |
|                    | MAJESTIC MILLING COMPANY,<br>Aurora, Mo.                    |                                                          |
| 10465              | Wheat Bran .....                                            | Merchants Grocery Co., Crystal Sp'gs.<br>Guarantee.....  |
|                    | GEO. B. MATTHEWS & SONS,<br>New Orleans, La.                |                                                          |
| 9615               | Rice Polish .....                                           | Lampton Merc. Co., Magnolia.....                         |
| 9616               | Rice Polish .....                                           | Hyman Merc. Co., Summit.....                             |
| 9617               | Rice Polish .....                                           | Holmes Bros., McComb.....                                |
| 9618               | Rice Polish .....                                           | Louis Cohn & Bros., Brookhaven.....                      |
| 10466              | Rice Polish .....                                           | Mills-Guy Co., McComb .....                              |
|                    | MEEK MILLING COMPANY,<br>Marissa, Ill.                      |                                                          |
| 9619               | Wheat Shorts.....                                           | Ruffin Merc. Co., Ellisville.....                        |
| 9620               | Wheat Shorts.....                                           | Winona .....                                             |
|                    | JOHN F. MEYER & SONS<br>MILLING COMPANY<br>Springfield, Mo. |                                                          |
| 9621               | Albatross Bran .....                                        | Postlethwaite & Chase Co., Natchez....                   |
| 9622               | Albatross Bran .....                                        | Postlethwaite & Chase Co., Natchez....                   |
| 10469              | Albatross Bran .....                                        | Postlethwaite & Chase Co., Natchez....<br>Guarantee..... |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9601               | 10.38              | 9.25          | 4.59                | 13.06                   | 50.50                   | 12.22                 |
| 9602               | 8.60               | 7.87          | 5.05                | 20.63                   | 46.00                   | 11.85                 |
| 9603               | 8.60               | 6.68          | 7.74                | 13.50                   | 57.90                   | 5.58                  |
| 9604               | 9.12               | 6.79          | 7.29                | 13.06                   | 57.21                   | 6.53                  |
| 9605               | 9.92               | 8.66          | 5.47                | 15.94                   | 48.10                   | 11.91                 |
| 9606               | 8.48               | 7.24          | 7.72                | 13.00                   | 58.08                   | 5.48                  |
| 9607               | 8.93               | 6.42          | 7.02                | 11.38                   | 60.13                   | 6.12                  |
| 9608               | 9.06               | 6.62          | 8.34                | 12.69                   | 57.83                   | 5.46                  |
| 9609               | 9.10               | 6.84          | 6.70                | 12.63                   | 59.17                   | 5.56                  |
| 9699               | 5.60               | 7.53          | 7.58                | 10.19                   | 48.05                   | 21.05                 |
|                    |                    |               | 6.00                | 11.00                   | 53.00                   | 11.00                 |
| 9610               | 9.29               | 6.37          | 3.80                | 15.50                   | 57.83                   | 7.21                  |
| 9611               | 9.36               | 6.87          | 4.43                | 15.69                   | 55.12                   | 8.53                  |
| 9612               | 8.44               | 5.91          | 4.05                | 15.56                   | 58.56                   | 7.48                  |
| 10463              | 9.50               | 6.64          | 3.88                | 14.50                   | 56.73                   | 8.75                  |
|                    |                    |               | 4.00                | 14.50                   | 50.00                   | 9.50                  |
| 9272               | 9.57               | 4.78          | 5.85                | 18.56                   | 53.12                   | 8.12                  |
| 9613               | 8.59               | 5.20          | 5.55                | 19.25                   | 55.42                   | 5.99                  |
| 10464              | 8.77               | 4.00          | 4.12                | 16.19                   | 61.34                   | 5.58                  |
|                    |                    |               | 4.00                | 16.00                   | 48.00                   | 6.00                  |
| 9614               | 9.63               | 6.64          | 4.16                | 16.31                   | 54.41                   | 8.85                  |
|                    |                    |               | 3.50                | 11.00                   | 50.00                   | 12.00                 |
| 10465              | 9.15               | 6.16          | 3.90                | 14.88                   | 60.32                   | 5.59                  |
|                    |                    |               | 3.75                | 14.60                   | 55.00                   | 8.00                  |
| 9615               | 11.73              | 6.43          | 9.90                | 13.31                   | 56.73                   | 1.90                  |
| 9616               | 11.13              | 6.97          | 12.35               | 14.31                   | 53.20                   | 2.04                  |
| 9617               | 12.05              | 4.50          | 7.81                | 12.44                   | 62.95                   | .25                   |
| 9618               | 11.65              | 8.41          | 8.07                | 12.63                   | 58.38                   | .86                   |
| 10466              | 8.44               | 4.13          | 7.03                | 16.94                   | 54.14                   | 9.32                  |
|                    |                    |               | 5.00                | 10.00                   | 50.00                   | 12.00                 |
| 9619               | 9.55               | 4.10          | 4.53                | 16.44                   | 60.29                   | 5.09                  |
| 9620               | 10.14              | 3.66          | 4.38                | 16.13                   | 61.18                   | 4.51                  |
|                    |                    |               | 3.50                | 13.50                   | 54.00                   | 8.50                  |
| 9621               | 8.46               | 6.25          | 4.95                | 18.25                   | 54.13                   | 7.96                  |
| 9622               | 8.90               | 6.43          | 4.83                | 17.63                   | 53.51                   | 8.70                  |
| 10469              | 10.38              | 5.93          | 4.42                | 20.56                   | 55.58                   | 3.13                  |
|                    |                    |               | 3.65                | 14.75                   | 52.00                   | 10.50                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.         |
|--------------------|---------------------------------------------------|----------------------------------------|
|                    | MILLSTADT MILLING COMPANY,<br>Millstadt, Ill.     |                                        |
| 9623               | Wheat Bran .....                                  | Threefoot Bros. & Co., Meridian.....   |
| 9624               | Wheat Bran .....                                  | Beaman & Co., Forest.....              |
|                    |                                                   | Guarantee.....                         |
| 9625               | Wheat Shorts.....                                 | Beaman & Co., Forest.....              |
|                    |                                                   | Guarantee.....                         |
|                    | R. P. MOORE MILLING Co.,<br>Princeton, Ind.       |                                        |
| 10470              | Wheat Bran.....                                   | Clark & Tyler, Holly Springs* .....    |
|                    | NEW ATHENS MILLING COMPANY<br>New Athens, Ill.    |                                        |
| 9626               | Wheat Bran and Screenings .....                   | J. L. Parkman, Oakvale.....            |
|                    |                                                   | Guarantee.....                         |
|                    | NEW IBERIA RICE MILLS,<br>New Iberia, La.         |                                        |
| 9627               | Rice Polish.....                                  | C. Atkinson's Sons Co., Summit .....   |
|                    |                                                   | Guarantee.....                         |
|                    | NUTRILINE MILLING COMPANY,<br>Crowley, La.        |                                        |
| 9327               | Nutriline .....                                   | A. Schofid, Bay St. Louis.....         |
| 10471              | Nutriline .....                                   | Buckley-Terry Co., Laurel.....         |
| 10472              | Nutriline .....                                   | W. A. McDonald, Bay St. Louis.....     |
|                    |                                                   | Guarantee.....                         |
|                    | PINCKNEYVILLE MILLING Co.,<br>Pinckneyville, Ill. |                                        |
| 10473              | Wheat Bran .....                                  | L. Lopez & Co., Biloxi.....            |
|                    |                                                   | Guarantee.....                         |
|                    | GEO. P. PLANT MILLING Co.,<br>St. Louis, Mo.      |                                        |
| 9628               | Wheat Bran .....                                  | B. Kullman & Co., Natchez.....         |
| 9629               | Wheat Bran .....                                  | Rumble & Wensel, Natchez.....          |
| 10474              | Wheat Bran .....                                  | A. Beer & Co., Natchez .....           |
|                    |                                                   | Guarantee.....                         |
| 10475              | Wheat Middlings .....                             | W. H. Pritchard & Co., Natchez.....    |
|                    |                                                   | Guarantee.....                         |
|                    | THE QUAKER OATS COMPANY,<br>Chicago, Ill.         |                                        |
| 9630               | Banner Feed .....                                 | R. Viener & Co., Natchez.....          |
| 9631               | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....  |
| 9632               | Banner Feed .....                                 | Merchants Grocery Co., Hattiesburg ..  |
| 9633               | Banner Feed .....                                 | Crawford Grocery Co., Greenville.....  |
| 9634               | Banner Feed .....                                 | Geisenberger & Friedler, Natchez ..... |
| 9635               | Banner Feed .....                                 | Crawford Grocery Co., Greenville.....  |
| 9636               | Banner Feed .....                                 | W. S. Campbell, Clarksdale.....        |
| 9637               | Banner Feed .....                                 | Planters Supply Co., Greenwood.....    |
| 9638               | Banner Feed .....                                 | W. S. Campbell, Clarksdale.....        |
| 9639               | Banner Feed .....                                 | R. Viener & Co., Natchez.....          |
| 9640               | Banner Feed .....                                 | W. B. Richardson, Newton.....          |
| 9641               | Banner Feed .....                                 | T. M. Thornston, Raymond.....          |

\*No guarantee submitted for this Brand.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9623               | 8.76               | 7.26          | 4.89                | 15.88                   | 53.76                   | 9.45                  |
| 9624               | 8.09               | 7.27          | 4.92                | 15.88                   | 54.59                   | 9.25                  |
|                    |                    |               | 3.50                | 11.27                   | 59.54                   | 6.04                  |
| 9625               | 10.78              | 4.70          | 5.50                | 17.56                   | 55.67                   | 5.79                  |
|                    |                    |               | 3.50                | 12.35                   | 72.80                   | 1.23                  |
| 10470              | 10.49              | 5.45          | 4.71                | 20.31                   | 51.41                   | 7.63                  |
| 9626               | 9.43               | 6.28          | 4.94                | 15.81                   | 55.78                   | 7.76                  |
|                    |                    |               | 3.50                | 14.00                   | 55.00                   | 9.50                  |
| 9627               | 11.95              | 5.15          | 8.30                | 11.56                   | 62.36                   | .68                   |
|                    |                    |               | 9.22                | 10.19                   | 62.97                   | 1.25                  |
| 9327               | 10.33              | 4.06          | 3.93                | 12.31                   | 60.66                   | 8.71                  |
| 10471              | 12.49              | 7.92          | 7.09                | 14.38                   | 49.39                   | 8.73                  |
| 10472              | 10.68              | 7.48          | 7.50                | 20.13                   | 45.20                   | 9.01                  |
|                    |                    |               | 3.50                | 12.00                   | 58.00                   | 10.00                 |
| 10473              | 11.44              | 5.12          | 4.54                | 14.69                   | 55.58                   | 8.63                  |
|                    |                    |               | 3.50                | 10.00                   | 54.50                   | 12.00                 |
| 9628               | 9.30               | 6.85          | 4.44                | 16.75                   | 53.66                   | 9.00                  |
| 9629               | 10.24              | 6.66          | 4.42                | 16.00                   | 53.32                   | 9.36                  |
| 10474              | 11.03              | 6.14          | 4.69                | 20.50                   | 49.20                   | 8.44                  |
|                    |                    |               | 4.00                | 16.00                   | 54.00                   | 9.00                  |
| 10475              | 11.22              | 4.49          | 5.23                | 22.94                   | 51.12                   | 5.00                  |
|                    |                    |               | 4.41                | 17.11                   | 59.18                   | 5.18                  |
| 9630               | 8.33               | 3.39          | 3.20                | 10.00                   | 66.17                   | 8.91                  |
| 9631               | 8.13               | 3.12          | 3.17                | 10.00                   | 66.36                   | 9.22                  |
| 9632               | 8.80               | 3.18          | 3.03                | 9.81                    | 64.94                   | 10.24                 |
| 9633               | 8.12               | 3.45          | 3.20                | 10.75                   | 64.29                   | 10.19                 |
| 9334               | 9.10               | 3.11          | 3.20                | 9.94                    | 66.35                   | 8.30                  |
| 9635               | 8.07               | 3.32          | 3.43                | 10.50                   | 64.51                   | 10.17                 |
| 9636               | 8.36               | 3.00          | 3.20                | 9.75                    | 66.73                   | 8.96                  |
| 9637               | 7.98               | 3.12          | 3.51                | 10.44                   | 65.25                   | 9.70                  |
| 9638               | 8.14               | 2.95          | 2.89                | 9.88                    | 66.43                   | 9.71                  |
| 9639               | 8.95               | 2.85          | 2.72                | 8.75                    | 67.91                   | 8.82                  |
| 9640               | 9.30               | 2.95          | 2.99                | 9.13                    | 66.44                   | 9.19                  |
| 9641               | 8.53               | 3.24          | 3.68                | 9.63                    | 64.60                   | 10.32                 |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.                      |
|--------------------|---------------------------------------------------|-----------------------------------------------------|
| 10476              | Banner Feed .....                                 | R. Viener & Co., Natchez.....                       |
| 10477              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....               |
| 10478              | Banner Feed .....                                 | Planters Supply Co., Greenwood.....                 |
| 10479              | Banner Feed .....                                 | W. S. Campbell, Clarksdale.....                     |
| 10480              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....               |
| 10481              | Banner Feed .....                                 | A. J. Lewis, Edwards.....                           |
| 10482              | Banner Feed .....                                 | R. Viener & Co., Natchez.....                       |
| 10483              | Banner Feed .....                                 | Merchants Grocery Co., Hattiesburg.....             |
| 10484              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....               |
| 10485              | Banner Feed .....                                 | P. P. Williams Co., Vicksburg.....                  |
|                    |                                                   | Guarantee.....                                      |
| 10486              | Blue Ribbon Feed.....                             | R. H. Green & Co., Jackson.....                     |
|                    |                                                   | Guarantee.....                                      |
|                    | RALSTON PURINA COMPANY,<br>St. Louis, Mo.         |                                                     |
| 9649               | Protena Feed .....                                | E. F. Elkin & Co., Meridian.....                    |
| 9650               | Protena Feed .....                                | Capital Grocery Co., Jackson.....                   |
| 10487              | Protena Feed .....                                | Rumble & Wensel, Natchez.....                       |
|                    |                                                   | Guarantee.....                                      |
| 10488              | Protena Dairy Feed .....                          | Capital Grocery Co., Jackson.....                   |
|                    |                                                   | Guarantee.....                                      |
| 9643               | Purina Feed .....                                 | W. O. Worrell & Co., Vicksburg.....                 |
| 9644               | Purina Feed .....                                 | The Goyer Co., Greenville.....                      |
| 9645               | Purina Feed .....                                 | Union Naval Stores, Gulfport.....                   |
| 9646               | Purina Feed .....                                 | Rumble & Wensel Co., Natchez.....                   |
| 9647               | Purina Feed .....                                 | The Goyer Co., Greenville.....                      |
| 9648               | Purina Feed .....                                 | Jones County Gin & Milling Co.,<br>Ellisville ..... |
| 10489              | Purina Feed .....                                 | W. O. Worrell, Vicksburg.....                       |
| 10490              | Purina Feed .....                                 | Rumble & Wensel Co., Natchez.....                   |
| 10491              | Purina Feed .....                                 | The Goyer Co., Greenville.....                      |
|                    |                                                   | Guarantee.....                                      |
| 9642               | Purina Mill Feed, Chick and<br>Scratch Size ..... | Capital Grocery Co., Jackson.....                   |
| 10492              | Purina Mill Feed, Chick and<br>Scratch Size ..... | Biloxi Milling Co., Biloxi.....                     |
| 10493              | Purina Mill Feed, Chick and<br>Scratch Size ..... | Capital Grocery Co., Jackson.....                   |
| 10494              | Purina Mill Feed, Chick and<br>Scratch Size ..... | Rumble & Wensel Co., Natchez.....                   |
| 10495              | Purina Mill Feed, Chick and<br>Scratch Size ..... | Hanes & Hood, Vicksburg.....                        |
|                    |                                                   | Guarantee.....                                      |
|                    | RAUCH MILLING COMPANY,<br>Belleville, Ill.        |                                                     |
| 9651               | Wheat Bran .....                                  | Merchants Grocery Co., Hazlehurst....               |
|                    |                                                   | Guarantee.....                                      |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 10476              | 10.59              | 3.39          | 3.49                | 13.25                   | 58.19                   | 11.09                 |
| 10477              | 9.84               | 3.13          | 3.39                | 13.38                   | 59.71                   | 10.55                 |
| 10478              | 11.26              | 3.14          | 2.68                | 14.19                   | 58.73                   | 10.00                 |
| 10479              | 10.87              | 3.40          | 3.53                | 14.00                   | 58.04                   | 10.16                 |
| 10480              | 9.77               | 3.28          | 3.38                | 14.19                   | 59.20                   | 10.18                 |
| 10481              | 11.33              | 3.40          | 3.43                | 13.19                   | 58.62                   | 10.03                 |
| 10482              | 11.45              | 3.31          | 3.08                | 13.56                   | 58.69                   | 9.91                  |
| 10483              | 10.07              | 3.27          | 3.53                | 12.75                   | 61.62                   | 8.76                  |
| 10484              | 9.21               | 3.26          | 3.05                | 13.69                   | 61.57                   | 9.22                  |
| 10485              | 10.52              | 3.06          | 3.49                | 14.19                   | 59.62                   | 9.12                  |
|                    |                    |               | 3.75                | 9.75                    | 63.00                   | 10.50                 |
| 10486              | 9.72               | 3.45          | 3.51                | 14.06                   | 59.97                   | 9.29                  |
|                    |                    |               | 3.75                | 9.75                    | 63.00                   | 10.50                 |
| 9649               | 7.41               | 3.64          | 3.93                | 13.38                   | 60.91                   | 10.73                 |
| 9650               | 7.94               | 3.94          | 4.22                | 12.13                   | 61.79                   | 9.98                  |
| 10487              | 10.96              | 4.67          | 3.84                | 16.88                   | 55.32                   | 8.33                  |
|                    |                    |               | 3.80                | 12.00                   | 58.00                   | 8.90                  |
| 10488              | 10.54              | 3.42          | 4.53                | 16.88                   | 57.59                   | 7.04                  |
|                    |                    |               | 3.50                | 20.00                   | 48.00                   | 16.00                 |
| 9643               | 8.46               | 3.21          | 4.15                | 13.25                   | 63.04                   | 7.89                  |
| 9644               | 8.26               | 3.55          | 4.99                | 12.94                   | 58.92                   | 11.34                 |
| 9645               | 8.32               | 3.76          | 4.12                | 13.19                   | 62.06                   | 8.55                  |
| 9646               | 7.75               | 4.46          | 5.37                | 13.00                   | 60.07                   | 9.35                  |
| 9647               | 8.05               | 4.00          | 4.38                | 13.81                   | 61.72                   | 8.04                  |
| 9648               | 7.84               | 4.21          | 3.91                | 12.81                   | 60.20                   | 11.03                 |
| 10489              | 9.73               | 4.29          | 4.57                | 17.44                   | 57.01                   | 6.96                  |
| 10490              | 9.58               | 4.51          | 4.71                | 16.44                   | 57.49                   | 7.27                  |
| 10491              | 12.62              | 4.93          | 3.76                | 16.44                   | 52.76                   | 9.49                  |
|                    |                    |               | 4.00                | 12.50                   | 53.00                   | 8.90                  |
| 9642               | 9.92               | 2.05          | 3.69                | 11.69                   | 69.80                   | 2.85                  |
| 10492              | 11.51              | 1.82          | 2.97                | 15.81                   | 64.82                   | 3.07                  |
| 10493              | 12.21              | 1.64          | 3.12                | 15.75                   | 64.20                   | 3.08                  |
| 10494              | 12.10              | 1.63          | 3.32                | 15.56                   | 64.81                   | 2.58                  |
| 10495              | 11.53              | 1.61          | 2.94                | 14.75                   | 66.05                   | 3.12                  |
|                    |                    |               | 3.60                | 11.00                   | 65.00                   | 4.00                  |
| 9651               | 10.10              | 6.28          | 4.66                | 14.88                   | 55.82                   | 8.26                  |
|                    |                    |               | 3.50                | 10.00                   | 55.00                   | 12.00                 |

TABLE I.---Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                  | Where and from Whom Collected.                         |
|--------------------|--------------------------------------------------|--------------------------------------------------------|
|                    | REA-PATTERSON MILLING Co.,<br>Coffeyville, Kan.  |                                                        |
| 9652               | Wheat Bran .....                                 | Parsons, May, Oberschmidt & Co.,<br>Brookhaven .....   |
| 9653               | Wheat Bran .....                                 | Threefoot Bros. & Co., Meridian.....                   |
| 9654               | Wheat Bran .....                                 | E. F. Elkins, Meridian.....                            |
| 9655               | Wheat Bran .....                                 | McInnis & Sturgis, Meridian.....<br>Guarantee.....     |
|                    | REICHERT MILLING Co.<br>Freeburg, Ill.           |                                                        |
| 10496              | Wheat Bran .....                                 | Lampton Bros. & Co., Tylertown.....<br>Guarantee.....  |
|                    | ROBERTS & HAMMER GRAIN Co.,<br>Memphis, Tenn.    |                                                        |
| 10497              | Wheat Shorts.....                                | B. M. Porter, Sardis*.....                             |
|                    | RUTHERFORD MILLING Co.,<br>Rutherford, Tenn.     |                                                        |
| 10498              | Wheat Bran .....                                 | Rodgers & Son, Tupelo.....<br>Guarantee.....           |
|                    | SAUERS MILLING COMPANY,<br>Evansville, Ind.      |                                                        |
| 9656               | Wheat Bran .....                                 | W. H. Pritchard & Co., Natchez.....<br>Guarantee.....  |
| 9657               | Shorts .....                                     | T. M. Steele & Son, Forest.....<br>Guarantee.....      |
|                    | N. SAUER MILLING COMPANY,<br>Cherryvale, Kan.    |                                                        |
| 9658               | Wheat Bran .....                                 | A. G. Russell Co., Vicksburg.....                      |
| 9659               | Wheat Bran .....                                 | E. Bonelli Co., Vicksburg.....                         |
| 9660               | Wheat Bran .....                                 | C. J. Edwards Co., Vicksburg.....<br>Guarantee.....    |
|                    | SCOTT COUNTY MILLING Co.,<br>Sikeston, Mo.       |                                                        |
| 9661               | Wheat Bran .....                                 | P. P. Williams Co., Vicksburg.....                     |
| 10499              | Wheat Bran .....                                 | Tom Lyle Grocery Co., Meridian .....                   |
|                    |                                                  | Guarantee.....                                         |
| 9662               | Shorts .....                                     | Queen City Feed Co., Meridian.....<br>Guarantee.....   |
|                    | STEELEVILLE MILLING COMPANY<br>Steeleville, Ill. |                                                        |
| 10500              | Wheat Bran .....                                 | D. C. Coney, Bogue Chitto.....<br>Guarantee.....       |
|                    | ST. MARY'S MILLING Co.,<br>St. Mary's, Mo.       |                                                        |
| 9663               | Wheat Bran .....                                 | T. E. Winn, Laurel.....                                |
| 9664               | Wheat Bran .....                                 | The Lampton Merc. Co., Magnolia.....<br>Guarantee..... |
| 9665               | Middlings .....                                  | John McGrath & Sons, Brookhaven.....                   |
| 9666               | Middlings .....                                  | Louis Cohn & Bros., Brookhaven.....<br>Guarantee.....  |

\* No guarantee submitted for this Brand.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 9652               | 9.18               | 6.36          | 4.55                | 17.06                   | 54.35                   | 8.50                  |
| 9653               | 8.78               | 6.30          | 4.39                | 16.69                   | 55.28                   | 8.56                  |
| 9654               | 8.11               | 6.09          | 4.41                | 16.19                   | 56.39                   | 8.81                  |
| 9655               | 8.14               | 6.11          | 4.36                | 16.81                   | 56.55                   | 8.03                  |
|                    |                    |               | 3.50                | 14.52                   | 55.96                   | 8.50                  |
| 10496              | 11.04              | 6.06          | 5.15                | 19.69                   | 50.18                   | 7.88                  |
|                    |                    |               | 4.50                | 15.50                   | 55.00                   | 9.00                  |
| 10497              | 9.64               | 3.36          | 4.40                | 21.19                   | 58.04                   | 3.37                  |
| 10498              | 9.71               | 3.14          | 4.58                | 18.06                   | 56.35                   | 8.16                  |
|                    |                    |               | 4.30                | 13.40                   | 57.70                   | 8.00                  |
| 9656               | 8.72               | 5.29          | 4.91                | 16.00                   | 56.55                   | 8.53                  |
|                    |                    |               | 3.50                | 14.26                   | 55.18                   | 8.80                  |
| 9657               | 10.62              | 3.30          | 4.34                | 15.75                   | 61.12                   | 4.87                  |
|                    |                    |               | 4.20                | 14.96                   | 60.10                   | 4.92                  |
| 9658               | 9.57               | 6.89          | 4.55                | 16.81                   | 52.08                   | 10.10                 |
| 9659               | 9.42               | 6.99          | 4.53                | 17.56                   | 51.36                   | 10.14                 |
| 9660               | 9.52               | 6.96          | 4.59                | 17.44                   | 50.54                   | 10.95                 |
|                    |                    |               | 3.95                | 15.00                   | 53.10                   | 11.65                 |
| 9661               | 9.04               | 16.02         | 5.02                | 16.06                   | 51.80                   | 2.06                  |
| 10499              | 9.52               | 5.96          | 4.66                | 20.00                   | 54.84                   | 5.02                  |
|                    |                    |               | 4.00                | 14.15                   | 55.00                   | 9.00                  |
| 9662               | 9.92               | 4.73          | 5.85                | 22.75                   | 51.35                   | 5.40                  |
|                    |                    |               | 5.93                | 16.27                   | 61.60                   | 4.50                  |
| 10500              | 11.46              | 2.05          | 4.84                | 19.38                   | 52.85                   | 9.42                  |
|                    |                    |               | 3.50                | 14.50                   | 50.00                   | 10.00                 |
| 9663               | 8.89               | 6.62          | 5.15                | 19.38                   | 57.16                   | 2.80                  |
| 9664               | 8.44               | 6.51          | 5.59                | 15.69                   | 55.17                   | 8.60                  |
|                    |                    |               | 3.56                | 15.06                   | 54.70                   | 8.93                  |
| 9665               | 10.25              | 3.28          | 4.93                | 16.06                   | 62.52                   | 2.96                  |
| 9666               | 10.48              | 3.53          | 4.69                | 15.81                   | 64.34                   | 1.15                  |
|                    |                    |               | 4.20                | 15.81                   | 62.37                   | 2.90                  |



| Laboratory Number. | Name of Brand and Manufacturer.               | Where and from Whom Collected.                       |
|--------------------|-----------------------------------------------|------------------------------------------------------|
|                    | THREEFOOT BROS. & COMPANY,<br>Meridian, Miss. |                                                      |
| 10501              | Rice Polish .....                             | Threefoot Bros. & Co., Meridian<br>Guarantee.....    |
|                    | JAC. TROUTMAN & COMPANY,<br>New Orleans, La.  |                                                      |
| 9667               | Rice Polish .....                             | J. K. Dunn, McComb.....                              |
| 9668               | Rice Polish.....                              | J. L. Moyse & Bro., Summit<br>Guarantee.....         |
|                    | VALLEY MILLING COMPANY,<br>St. Louis, Mo.     |                                                      |
| 10502              | Delta Feed .....                              | I. Lowenberg & Co., Natchez.                         |
| 10503              | Delta Feed .....                              | I. Lowenberg & Co., Natchez<br>Guarantee.....        |
|                    | JOHN WADE & SONS,<br>Memphis, Tenn.           |                                                      |
| 9669               | Wheat Bran .....                              | L. H. Doty, Kosciusko.....                           |
| 9670               | Wheat Bran .....                              | Grenada Merc. Co., Grenada.....                      |
| 9671               | Wheat Bran .....                              | L. W. Mackey, Water Valley.....                      |
| 9672               | Wheat Bran .....                              | Sterns Bros. & Co., Greenwood<br>Guarantee.....      |
| 9673               | Purity Feed .....                             | Sterns Bros. Co., Greenwood.....                     |
| 9674               | Purity Feed .....                             | G. Lowenberg & Co., Kosciusko.....                   |
| 9675               | Purity Feed .....                             | McMahon Grocery Co., Greenville.....                 |
| 9676               | Purity Feed .....                             | Sterns Bros. Co., Greenwood<br>Guarantee.....        |
|                    | WEBB & MAURY,<br>Memphis, Tenn.               |                                                      |
| 9677               | Wheat Bran .....                              | J. J. Pleasant, Clarksdale.....                      |
| 10504              | Wheat Bran .....                              | J. J. Pleasant, Clarksdale<br>Guarantee.....         |
| 10505              | Memphis Stock Feed .....                      | J. M. Moore, Eupora.....                             |
| 10506              | Wheat Shorts.....                             | J. M. Moore, Eupora<br>Guarantee.....                |
|                    | YATES & DONELSON COMPANY,<br>Memphis, Tenn.   |                                                      |
| 9678               | Wheat Bran mixed with Corn<br>Bran .....      | R. H. Green & Bro., Jackson.....                     |
| 9679               | Wheat Bran mixed with Corn<br>Bran .....      | McMahon Grocery Co., Greenville.....                 |
| 9680               | Wheat Bran mixed with Corn<br>Bran .....      | Yazoo Grocery Co., Yazoo City.....                   |
| 9681               | Wheat Bran mixed with Corn<br>Bran .....      | Peets & Norman Co., Hazlehurst.....                  |
| 10507              | Wheat Bran mixed with Corn<br>Bran .....      | The Planters Supply Co., Greenwood<br>Guarantee..... |
| 10508              | Feed Meal.....                                | Biloxi Milling Co., Biloxi<br>Guarantee.....         |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent.  | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|----------------------|-------------------------|-------------------------|-----------------------|
| 10501              | 10.80              | 4.84          | 9.28<br><i>10.00</i> | 17.69<br><i>10.50</i>   | 55.38<br><i>56.00</i>   | 2.01<br><i>2.00</i>   |
| 9667               | 10.09              | 4.13          | 8.31                 | 12.63                   | 63.55                   | 1.29                  |
| 9668               | 10.45              | 5.42          | 8.13<br><i>6.25</i>  | 10.56<br><i>9.62</i>    | 63.92<br><i>69.22</i>   | 1.52<br><i>1.20</i>   |
| 10502              | 9.92               | 2.84          | 4.32                 | 13.19                   | 59.02                   | 10.71                 |
| 10503              | 8.18               | 3.64          | 4.16<br><i>5.00</i>  | 12.31<br><i>8.50</i>    | 60.57<br><i>50.00</i>   | 11.14<br><i>12.00</i> |
| 9669               | 9.27               | 6.09          | 4.65                 | 17.75                   | 51.10                   | 11.14                 |
| 9670               | 8.70               | 7.15          | 4.30                 | 16.13                   | 55.15                   | 8.57                  |
| 9671               | 9.47               | 5.69          | 4.19                 | 16.50                   | 53.43                   | 10.72                 |
| 9672               | 8.96               | 6.34          | 4.48<br><i>3.50</i>  | 14.25<br><i>10.00</i>   | 59.80<br><i>50.00</i>   | 6.17<br><i>12.00</i>  |
| 9673               | 9.98               | 2.55          | 3.74                 | 9.25                    | 69.46                   | 5.02                  |
| 9674               | 9.90               | 2.02          | 4.78                 | 8.94                    | 69.03                   | 5.33                  |
| 9675               | 9.72               | 1.98          | 5.15                 | 9.25                    | 68.87                   | 5.03                  |
| 9676               | 7.59               | 2.11          | 4.79<br><i>5.00</i>  | 9.75<br><i>10.00</i>    | 71.21<br><i>65.00</i>   | 4.56<br><i>5.50</i>   |
| 9677               | 9.61               | 5.72          | 4.68                 | 16.38                   | 57.86                   | 5.75                  |
| 10504              | 10.10              | 6.32          | 4.34<br><i>3.50</i>  | 20.56<br><i>10.00</i>   | 48.60<br><i>50.00</i>   | 10.08<br><i>12.00</i> |
| 10505              | 10.56              | 5.52          | 5.93<br><i>3.50</i>  | 19.31<br><i>10.00</i>   | 50.23<br><i>40.00</i>   | 8.45<br><i>12.00</i>  |
| 10506              | 10.67              | 4.37          | 5.51<br><i>3.50</i>  | 19.56<br><i>10.00</i>   | 54.12<br><i>50.00</i>   | 5.77<br><i>12.00</i>  |
| 9678               | 8.50               | 5.51          | 5.15                 | 15.06                   | 58.91                   | 6.87                  |
| 9679               | 7.68               | 5.59          | 5.16                 | 15.06                   | 59.06                   | 7.45                  |
| 9680               | 8.29               | 4.75          | 4.69                 | 14.06                   | 58.68                   | 9.53                  |
| 9681               | 8.64               | 5.13          | 4.95                 | 14.50                   | 59.28                   | 7.50                  |
| 10507              | 9.50               | 4.25          | 4.74<br><i>3.70</i>  | 18.38<br><i>13.25</i>   | 54.25<br><i>57.15</i>   | 8.88<br><i>10.00</i>  |
| 10508              | 9.60               | 1.48          | 6.98<br><i>6.90</i>  | 11.81<br><i>10.10</i>   | 62.58<br><i>64.25</i>   | 7.55<br><i>6.60</i>   |

| Laboratory Number. | Name of Brand and Manufacturer.                | Where and from Whom Collected.       |
|--------------------|------------------------------------------------|--------------------------------------|
|                    | BLODGETT GRAIN & ELEVATOR Co.<br>Blodgett, Mo. |                                      |
| 10203              | Chops .....                                    | L. Funkenstein, Meridian*.....       |
|                    | DRAGO BROS.,<br>Council Bluffs, Iowa.          |                                      |
| 10527              | Mixed Chops .....                              | A. J. Lyons & Co., Meridian*.....    |
|                    | HENRY A. KLYCE Co.,<br>Dyersburg, Tenn.        |                                      |
| 9585               | Corn Chops.....                                | J. K. Dunn, McComb.....              |
| 9586               | Corn Chops.....                                | Cohen & Feld, Vicksburg.....         |
| 9587               | Corn Chops.....                                | A. J. Lyons & Co., Meridian.....     |
| 9588               | Corn Chops.....                                | Harris & Co., Meridian.....          |
| 9589               | Corn Chops.....                                | A. J. Lyons & Co., Meridian.....     |
| 9590               | Corn Chops.....                                | Queen City Feed Co., Meridian.....   |
| 9591               | Corn Chops.....                                | Union Naval Stores, Gulfport.....    |
| 9592               | Corn Chops.....                                | McInnis & Sturges, Meridian.....     |
| 9593               | Corn Chops.....                                | The Mississippi Company, Canton..... |
| 10204              | Chops .....                                    | A. J. Lyons & Co., Meridian.....     |
| 10205              | Chops .....                                    | Harris & Co., Meridian.....          |
| 10206              | Corn Chops.....                                | Queen City Feed Co., Meridian.....   |
| 10207              | Chops .....                                    | Winner, Klein Co., Meridian.....     |
|                    | McINNIS & STURGIS,<br>Meridian, Miss.          | Guarantee.....                       |
| 10208              | Chops .....                                    | Meyer Bros., Meridian.....           |
| 10209              | Corn Chops.....                                | McInnis & Sturges, Meridian.....     |
| 10210              | Corn Chops.....                                | Meyer Bros., Meridian.....           |
| 10467              | Chops .....                                    | Deemer Mfg. Co., Deemer.....         |
| 10468              | Chops .....                                    | Capital Grocery Co., Jackson.....    |
|                    | WILLIAMS-FITZHUGH Co.,<br>Memphis, Tenn.       | Guarantee.....                       |
| 10211              | Corn Chops.....                                | A. J. Lyons & Co., Meridian*.....    |

\* No guarantee submitted for this Brand.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 10203              | 12.63              | 1.23          | 3.65                | 8.63                    | 72.35                   | 1.51                  |
| 10527              | 16.72              | 1.04          | 2.40                | 8.06                    | 68.76                   | 3.02                  |
| 9585               | 11.06              | 1.36          | 3.94                | 9.44                    | 71.96                   | 2.24                  |
| 9586               | 11.30              | 1.36          | 4.25                | 8.94                    | 63.77                   | 10.38                 |
| 9587               | 12.06              | 1.14          | 3.32                | 8.94                    | 70.27                   | 4.27                  |
| 9588               | 12.65              | 1.44          | 3.26                | 8.88                    | 69.73                   | 4.04                  |
| 9589               | 13.06              | 1.61          | 3.70                | 9.00                    | 67.83                   | 4.80                  |
| 9590               | 13.14              | 1.55          | 3.71                | 9.00                    | 69.30                   | 3.30                  |
| 9591               | 13.34              | 1.44          | 3.10                | 8.31                    | 69.29                   | 4.52                  |
| 9592               | 11.53              | 1.45          | 2.96                | 8.19                    | 71.85                   | 4.02                  |
| 9593               | 11.31              | 1.48          | 4.17                | 9.25                    | 71.48                   | 2.31                  |
| 10204              | 14.29              | 2.15          | 3.41                | 7.31                    | 68.92                   | 3.92                  |
| 10205              | 13.23              | 2.61          | 3.60                | 7.94                    | 68.80                   | 3.82                  |
| 10206              | 12.96              | 2.52          | 3.28                | 7.69                    | 70.77                   | 2.78                  |
| 10207              | 13.69              | 2.41          | 3.22                | 7.38                    | 70.65                   | 2.65                  |
|                    |                    |               | 3.50                | 10.00                   | 60.00                   | 12.00                 |
| 10208              | 14.84              | 1.14          | 3.27                | 7.44                    | 70.15                   | 3.16                  |
| 10209              | 14.19              | 1.08          | 3.07                | 7.31                    | 71.89                   | 2.46                  |
| 10210              | 14.93              | 1.16          | 2.79                | 7.88                    | 70.99                   | 2.25                  |
| 10467              | 14.05              | .98           | 2.84                | 11.31                   | 59.81                   | 11.01                 |
| 10468              | 12.40              | .97           | 3.43                | 12.63                   | 67.57                   | 3.00                  |
|                    |                    |               | 3.50                | 10.00                   | 60.00                   | 12.00                 |
| 10211              | 14.24              | 1.21          | 4.13                | 8.19                    | 70.73                   | 1.50                  |



| Laboratory Number. | Name of Brand and Manufacturer.                                          | Where and from Whom Collected.                         |
|--------------------|--------------------------------------------------------------------------|--------------------------------------------------------|
| 10406              | ARKADELPHIA MILLING CO.,<br>Arkadelphia, Ark.<br>Mixed Bran .....        | Queen City Feed Store, Meridian.....<br>Guarantee..... |
| 10414              | CAPITAL GRAIN & MILL CO.,<br>Nashville, Tenn.<br>Alfacorn Feed .....     | E. W. Trautman, Long Beach.....                        |
| 10415              | Alfacorn Feed .....                                                      | Hood Milling Co., Gulfport.....<br>Guarantee.....      |
| 10426              | J. B. EDGAR GRAIN COMPANY,<br>Memphis, Tenn.<br>Ceralfa Stock Feed ..... | W. H. Pritchard & Co., Natchez.....<br>Guarantee.....  |
| 10436              | GREAT WESTERN CEREAL CO.,<br>Chicago, Ill.<br>Boss Chop Feed.....        | Taylor-Wills Grocery Co., Jackson...<br>Guarantee..... |
| 10439              | Daisy Dairy Feed .....                                                   | P. P. Williams Co., Vicksburg...<br>Guarantee.....     |
| 9552               | Durham Chop Feed .....                                                   | I. Lowenberg & Co., Natchez.....                       |
| 10442              | Durham Chop Feed .....                                                   | I. Lowenberg & Co., Natchez.....                       |
| 10443              | Durham Chop Feed .....                                                   | I. Lowenberg & Co., Natchez.....<br>Guarantee.....     |
| 10444              | Excelsior Chop Feed.....                                                 | P. P. Williams Co., Vicksburg.....<br>Guarantee.....   |
| 9567               | HARDY GRAIN COMPANY,<br>Union City, Tenn.<br>Mixed Feed Bran .....       | Queen City F. & P. Co., Meridian.....                  |
| 9568               | Mixed Feed Bran .....                                                    | Winner-Klein & Co., Meridian.....                      |
| 9569               | Mixed Feed Bran .....                                                    | J. S. Allred, Hazlehurst.....                          |
| 9570               | Mixed Feed Bran .....                                                    | Hattiesburg Grocery Co., Hattiesburg                   |
| 9571               | Mixed Feed Bran .....                                                    | A. J. Lyons & Co., Meridian.....<br>Guarantee.....     |
| 9588               | HENRY A. KLYCE COMPANY,<br>Dyersburg, Tenn.<br>Corn Chops.....           | Harris & Co., Meridian.....                            |
| 9591               | Corn Chops.....                                                          | Union Naval Stores, Gulfport.....                      |
| 9592               | Corn Chops.....                                                          | McInnis & Sturgis, Meridian.....                       |
| 10204              | Chops.....                                                               | A. J. Lyons & Co., Meridian.....                       |
| 10205              | Chops.....                                                               | Harris & Co., Meridian.....                            |
| 10206              | Corn Chops.....                                                          | Queen City Feed Co., Meridian.....                     |
| 10207              | Chops.....                                                               | Winner-Klein Co., Meridian.....<br>Guarantee.....      |
| 10208              | McINNIS & STURGIS,<br>Meridian, Miss.<br>Mixed Chops.....                | Meyer Bros., Meridian.....                             |
| 10209              | Mixed Corn Chops.....                                                    | McInnis & Sturgis, Meridian.....                       |
| 10210              | Mixed Corn Chops.....                                                    | Meyer Bros., Meridian.....<br>Guarantee.....           |
| 9673               | JOHN WADE & SONS,<br>Memphis, Tenn.<br>Purity Feed .....                 | Sterns Bros. Co., Greenwood.....<br>Guarantee.....     |

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein Per Cent. | Carbohydrates Per Cent. | Crude Fiber Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 10406              | 10.31              | 6.23          | 3.51<br>4.02        | 12.38<br>15.00          | 57.10<br>52.89          | 10.47<br>8.88         |
| 10414              | 12.07              | 4.37          | 2.84                | 10.44                   | 60.37                   | 9.91                  |
| 10415              | 12.50              | 3.65          | 3.31<br>3.50        | 10.13<br>12.00          | 60.50<br>54.00          | 9.91<br>12.00         |
| 10426              | 11.41              | 7.91          | 3.68<br>4.50        | 12.88<br>14.00          | 55.05<br>50.00          | 9.07<br>11.50         |
| 10436              | 11.30              | 1.97          | 2.93<br>4.00        | 8.63<br>9.50            | 68.54<br>62.00          | 6.63<br>10.00         |
| 10439              | 14.97              | 9.04          | 3.09<br>3.50        | 11.75<br>14.00          | 50.93<br>60.00          | 10.22<br>11.00        |
| 9552               | 8.17               | 4.07          | 3.68                | 8.44                    | 64.82                   | 10.82                 |
| 10442              | 12.24              | 3.26          | 3.85                | 8.06                    | 64.49                   | 8.10                  |
| 10443              | 10.34              | 5.67          | 4.03<br>4.00        | 7.69<br>9.50            | 62.23<br>62.00          | 10.04<br>10.00        |
| 10444              | 9.54               | 4.93          | 3.85<br>4.00        | 8.13<br>9.50            | 67.36<br>62.00          | 6.19<br>10.00         |
| 9567               | 8.02               | 4.32          | 2.93                | 10.56                   | 57.15                   | 17.02                 |
| 9568               | 8.53               | 3.39          | 2.97                | 8.38                    | 56.71                   | 20.02                 |
| 9569               | 9.25               | 3.85          | 2.95                | 8.19                    | 55.66                   | 20.10                 |
| 9570               | 5.79               | 7.17          | 2.75                | 8.94                    | 55.37                   | 19.98                 |
| 9571               | 8.83               | 4.21          | 2.93<br>4.00        | 9.50<br>12.01           | 55.93<br>54.02          | 18.60<br>6.61         |
| 9588               | 12.65              | 1.44          | 3.26                | 8.88                    | 69.73                   | 4.04                  |
| 9591               | 13.34              | 1.44          | 3.10                | 8.31                    | 69.29                   | 4.52                  |
| 9592               | 11.53              | 1.45          | 2.96                | 8.19                    | 71.85                   | 4.02                  |
| 10204              | 14.29              | 2.15          | 3.41                | 7.31                    | 68.92                   | 3.92                  |
| 10205              | 13.23              | 2.61          | 3.60                | 7.94                    | 68.80                   | 3.82                  |
| 10206              | 12.96              | 2.52          | 3.28                | 7.69                    | 70.77                   | 2.78                  |
| 10207              | 13.69              | 2.41          | 3.22<br>3.50        | 7.38<br>10.00           | 70.65<br>60.00          | 2.65<br>12.00         |
| 10208              | 14.84              | 1.14          | 3.27                | 7.44                    | 70.15                   | 3.16                  |
| 10209              | 14.19              | 1.08          | 3.07                | 7.31                    | 71.89                   | 2.46                  |
| 10210              | 14.93              | 1.16          | 2.79<br>3.50        | 7.88<br>10.00           | 70.99<br>60.00          | 2.25<br>12.00         |
| 9673               | 9.98               | 2.55          | 3.74<br>5.00        | 9.25<br>10.00           | 69.46<br>65.00          | 5.02<br>5.50          |



# Mississippi Agricultural Experiment Station.

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BULLETIN 124.

OCTOBER, 1909.

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## PECAN CULTURE.

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By GEORGE L. CLOTHIER.

Much has been written about the culture of the pecan by way of advertising. The purpose of this circular is to set forth impartially the actual facts with reference to pecan culture as far as they are known to apply to Mississippi.

The first caution which we propose to emphasize is never to plant seed or seedlings in hopes of getting remunerative returns. Many orchards have been started in this state from choice seed of some of the older named varieties. The results have been universally disappointing because the pecan is as variable as the apple or peach. Grafted or budded trees of standard varieties will cost on the average about one dollar apiece. We should cheerfully be willing to make this initial expenditure to insure that our trees will bear the kind of nuts desired. Don't imagine that you are paying the propagator too much for the nursery stock providing he furnishes you good healthy trees true to name at the price above mentioned.

Grafting and budding the pecan is not the simple operation it is with the apple and peach. Skilled propagators are satisfied if fifty per cent of their efforts at budding or grafting are successful.

Choice of Varieties.

More than one hundred varieties have been propagated and sold by nurserymen. To establish a successful orchard, it is not necessary that we plant all the varieties on the market. We will be more likely to attain satisfactory results if we limit our planting to five or six of the best varieties. For general planting in Mississippi we would recommend Stuart, Pabst, Van Deman, Russell, Schley, and Success. Other varieties highly recommended are Money Maker, Frotscher, Georgia, and Centennial. Experiments have not been sufficiently exhaustive to determine the exact area of the state to which each of the above named varieties is best adapted.

Selection of Location and Site.

The best success with pecan growing in this state has been attained near the Gulf coast. We are not certain whether this success is due to favorable climate, hospitable soil, or to the peculiar bent of the people. If a warm, humid climate is essential to the production of large well filled paper-shell nuts, then the Gulf coast is likely to remain the chief pecan growing section of the state. If either of the other two factors suggested are responsible, there is no valid reason why the culture of this nutritious nut should not extend to all parts of the state, because man can ameliorate the soil and change his bent if he is in earnest. We would suggest that planters proposing to set pecan orchards at a distance of more than 100 miles from the coast, proceed cautiously until they have demonstrated whether or not the planting promises remunerative returns.

Good soil is essential to success in pecan growing. An ideal soil is black rich alluvial loam, well drained, and overlying a porous sub-soil with the water table at least ten feet below the surface. If the soil is not naturally ideal, it can be made so providing it does not rest on an impervious subsoil and can be thoroughly drained.

Fertilizers and manures can be used on light sandy soils to enrich and fill them with humus while dense clays may be rendered more porous and penetrable by the addition of vegetable matter. Green manuring accompanied by liberal applications of bone meal and acid phosphate will enrich a light sandy soil, while deep plowing accompanied by generous supplies of stable manure will almost invariably ameliorate a sticky clay. The sandy soil if it can be made sufficiently rich in phosphates and lime is likely to prove the very best soil obtainable for pecan culture.

The nitrogen, of which there must be a plentiful supply in the soil, may be obtained by growing leguminous crops, such as cowpeas, soy beans, garden peas, and the various clovers and vetches and plowing the crops under when the stems begin to get woody. There is no excuse for the purchase of nitrogen in Mississippi when it can be obtained from the atmosphere at so small a cost through the aid of legumes.

Wet swampy soil must be drained if it is to be devoted to pecan culture. Black limy soil is suited to the pecan provided it is well drained and well filled with humus. If there is any doubt about the permanent drainage of the site proposed, it would be better to abandon the project rather than run the risk of failure, because the pecan tree cannot endure "wet feet."

Purchasing Nursery Stock.

Purchase trees only from a reputable nurseryman. Traveling agents are not usually trustworthy. The tree peddler almost invariably represents nobody but himself, and after he has taken his orders, he seeks a nursery that will sell him a lot of unsalable odds and ends at a very low price. With this kind of stuff he fills his orders, substituting other varieties or even seedlings for the high priced fancy varieties he sold his customers from the pictures he carried along with which to entice the unwary. Next to the tree peddler in unreliability is the small local dealer who advertises that he has a nursery and begs the people to patronize "home industries," but who purchases nearly everything he sells, from wholesale nurseries located in distant states. Trees handled in this way are liable to be damaged in shipment and are often not true to name. Purchasers should insist that nurserymen furnish the stock purchased without any substitution, and should prosecute every case of substitution to the full extent of the law, no matter whether a more costly or inferior tree is substituted. What a purchaser of nursery stock wants to be sure of above all other contingencies is that he is getting the variety he has ordered, and any substitution that may be made without his consent is obtaining money under false pretenses and should send the nurseryman making the substitution to prison.

Since the propagator of the pecan has a very difficult task to perform, it often happens that the graft or bud fails and the seedling stock makes a second growth from a point just below where the scion ought to have started. This causes the seedling to look like a budded or grafted tree. The propagator may be tempted by financial straits to sell such bogus trees for true named varieties, and so it behooves the purchaser to know his nurseryman personally to be sure that he is getting grafted trees that are actually true to name. The guarantee afforded by the reputation of the dealer is what the purchaser is expected to pay for; and if the nurseryman is inflexibly honest, he ought to be paid well for this guarantee, hence "cheap trees" are not recommended.

Returns from Pecan Orchards.

Fabulous tales have been told with reference to the returns that may be legitimately expected from a pecan orchard. A few isolated trees have produced annually from 100 pounds to 300 pounds of nuts per tree and these yields have been heralded abroad as the possible production that may be expected by an investor from a large orchard. The writer knows of no instance where a whole orchard of any con-

siderable area has shown such prolificacy. It is unsafe to generalize with reference to pecan yields because our data from which to draw conclusions are so meager. The one thing that an investor may be sure of, is that his investment will not turn out as it has been painted by the advertisers of the pecan industry. A pecan orchard is a long-time investment with deferred dividends. The average orchard will not begin to earn rental on the land it occupies until it is ten years old. Dividends on the investment need not be expected much short of fifteen years. To the one who can afford to wait fifteen years, a pecan orchard of choice grafted paper-shell varieties on good soil may possibly prove a bonanza yielding its thousand fold to its owner. That the market for the crop is practically unlimited is a fact beyond question.

Heavy crops of nuts every year need not be expected. The pecan is a forest tree with such a short period of domestication to its credit that we must expect it to behave somewhat as the wild trees do. Wild trees are notoriously unreliable as to their seed production. It is likely however to prove more regular in its bearing than the peach, because the production of its nuts on the new wood, tends to render its blossoms immune against late frosts.

Planting the Orchard.

After the investor has decided for himself that a pecan orchard is a promising investment and has selected his location and become owner of the proposed site, the next problem he has to solve is how to get the trees planted and started off growing. No amount of pains should be spared in the preparation of the site. Don't plant the trees with the expectation that the preparation will be given after they have been set out. Preparation by deep plowing and subsoiling of every square foot of the site should be begun a year before the trees are planted. Cowpeas or other legumes should be grown on the land and plowed under to a depth of ten or twelve inches.

The best season to plant pecan trees is in December and January. Repeated failures with spring planting have convinced the writer that spring is not the best time to plant in Mississippi. The soil is usually too wet to handle in spring time in such a manner as to prevent its puddling. December and January are the months in which the soil is usually in best condition, and winter planting gives the roots a chance to start before the buds burst.

The ground should be staked out early in the fall so as to afford accurate information with reference to the number of trees required to fill the site. The order for the trees should be sent to the nursery

not later than October, with instructions for shipment in time for use when needed.

The orchardist may lay out his orchard so that the trees will be equal distances apart in squares or equilateral triangles, or he may plant in rectangles in which the distances will not be the same in two directions. Many writers recommend setting the trees 60 to 80 feet apart, but the writer believes that 50 feet apart in equilateral triangles will prove to be the best spacing. To lay off the field by this method a row is lined out 22 to 25 feet from the boundary of the orchard parallel with its longest side. Beginning 25 feet from the end of this first row a stake is set, and stakes are set every 50 feet along this first row. Two wires exactly 50 feet long with loops in each end are fastened over two adjacent stakes at one end of the first row and swung around so that the loops on the other two ends of the wires will be placed over each other. Another stake is driven through these loops; and the wires are then carried to the opposite end of the field and a new stake set in the same way and from these stakes a second row is lined out which should be exactly 43 feet and 4 inches perpendicularly from the first row. The second row is then measured off into 50-foot intervals marked by stakes just as was the first row, but the measurements are made in the opposite direction. The two end stakes of the third row are set by the help of the wires in the same way, and the position of these stakes corrected to make the perpendicular distance between the rows exactly 43 feet and 4 inches as was done in laying out the second row. The 50-foot intervals are then laid off on the third row in the same direction as was done in laying out the first row.

After the field has been laid out in this careful manner, it will be necessary to correct any errors of position of stakes by sighting across the field in three directions. To do this accurately, three men should do the sighting and one adjust or reset the stakes. When digging the holes a planting board six feet long and eight or ten inches wide should be used. A notch in the middle of this board about four inches deep marks the position of the tree, and two inch augur holes near the ends will permit pegs to be driven through the board to hold it in position. Before digging a hole the planting board is laid on the ground with the center of the notch close up against the stake that marks the position of the tree. The two pegs at the ends of the board are then driven into the ground and left standing and the board is removed. The hole is dug and the removed soil is so placed as to allow the planting board to be put down again in exactly the same position it occupied the first time. When planting the tree, its stem is held erect close against the board in the middle of the notch,

and thus the tree is made to occupy the exact spot where the stake marking its site was driven.

Another method that gives fairly good results is to dig a post hole three feet deep, where the stake is driven, marking the site of the tree, and when the soil is dug out from around the post hole the workmen are instructed to leave the bottom of the post hole undisturbed. The tree is then set so that its stem is vertical over the center of the bottom of the post hole.

Marking out a field in squares or rectangles is so simple that instructions here need not be given. The triangular method affords the best possible spacing and utilizes all the ground permitting the planting of ten to fifteen per cent more trees on the same area than can be planted in squares with the same spacing. An acre will hold 19 1-3 trees set 50 feet apart in equilateral triangles, or 17 4-10 trees set the same distance apart in squares. When set 60 feet apart by the triangular method 13 9-10 trees may be placed on an acre; if set 60 feet apart by the square method, 12 1-10 trees will be required.

Since the pecan tree naturally develops a tap root which should be removed with the tree to a depth of 20 to 30 inches when digging it from the nursery, it is necessary to dig deep holes for planting the trees. A good plan is to remove at least a cubic yard of soil from each hole. Digging the holes may be commenced in October and it is desirable that they all be dug before planting is begun. When the tree is planted, the hole should be filled as nearly as possible with rich surface soil. A pound of bone meal sifted in around the roots of the tree at the time it is planted is advisable. The planting operation should be done with great care. Any broken or bruised roots should be pruned back to sound wood, but the tops should not be cut back. If it is necessary to reduce the top to correspond with the curtailed root system, wait till the buds are bursting in spring and then prune and coat every cut surface with grafting wax at the time of pruning. Fall pruning exposes the tree to loss of moisture during the winter season, and should never be practiced on a newly planted tree.

How to Cultivate and Care for a Pecan Orchard.

The pecan orchard should be kept as well cultivated during its formative age as the cotton field. While the trees are approaching the fruiting age, the spaces between the rows should be used for the growth of crops that will keep the weeds in subjection and pay for the labor of cultivating the trees. Truck crops such as potatoes, sweet potatoes, cabbage, tomatoes and beans are excellent to grow between pecan trees. Cowpeas should be grown on the orchard site

as frequently as possible and the peavines should be turned under with the plow to keep up the supply of humus in the soil.

Rank growing crops like corn should not be planted in the pecan orchard, neither should the small grains be sown. If it is necessary to grow a field crop, cotton is much to be preferred to corn. Hay crops should not be grown.

Winter cover crops should be grown on the orchard site to prevent the soil from washing and leaching. Oats and vetch serve this purpose well, but the crop should never be allowed to mature into a hay or grain crop. The oats and vetch should be plowed under early in the spring. A good rotation is oats and vetch for green manure followed by potatoes, and these followed by cowpeas. The cowpeas should be permitted to ripen and the grain may be gathered by hogs. The pea vines should be plowed under late in the fall and oats and vetch should again be sown. In working the land between the rows of trees, great care should be used to prevent the teams and implements from skinning the trees. Every wound made on a tree in this way endangers its life.

The pecan orchard should not be permitted to become sodded until the trees are practically mature, and at that date Bermuda grass should be excluded. Blue grass and white clover form the very best permanent sod that can be put into an orchard. Alfalfa may follow the blue grass and white clover after the trees reach an age of 30 years, but it should never be sown in a young orchard. If after lying in sod a few years, the orchard shows signs of poor health, the sod should be broken out and cultivation renewed. It is never wise to permit trees to become "sod-bound."

Pruning.

Pruning is a surgical operation at best and should only be applied by one who knows exactly what result is to be attained. The chief purpose of pruning is to shape the crown of the tree to suit the orchardist. Low heads are better than high facilitating the picking of the nuts, and affording less opportunity for wind to damage the trees.

Pecan trees cannot be kept circumscribed within the limits desirable with fruit trees, hence pruning the pecan should aim chiefly to secure the ideal hemispherical head free from dead limbs and having the bearing wood distributed where it will receive abundant sunlight. If the branches in the interior of the crown are so thick as to interfere with each other, thinning out the excess may be necessary. There is a popular superstition that cutting off the branches of a tree will exert some mysterious influence to make the tree more fruitful

or more thrifty. This is a fallacy, and the best advice that can be given to one holding this view is not to prune at all, since ignorance of the laws of plant growth may cause the would-be benefactor of the tree to injure or destroy it with the knife.

Top Working Old Trees.

Millions of wild pecan trees in the Southern States are now cumberers of the ground that might be made a source of great profit, if their owners would but have the confidence to top work these inferior trees with prolific paper-shell varieties. Top working is no easy project and costs, on the average, about five dollars per tree. The top of the inferior tree is nearly all cut back in the winter season so that the limbs are nothing but short stumps. Young, vigorous sprouts start from the short stumpy limbs in the spring, and in August or September of the first season these young shoots are budded with the desired variety. After the buds "take" the supernumerary young sprouts are cut off close up to the old limbs. The budded sprouts are cut back to an inch or two above the bud the next season, and all the energy is thus thrown into the bud. From ten to a dozen buds are set to form the new crown of each tree, and after the permanence of the new growth is assured, all the old top should be pruned away.

In four or five years, a top-worked tree will be paying its owner handsome returns. It is possible that grafting may be performed upon the sprouts with good results, but the proper season for making the grafts is February or March, at the end of the first year's growth of the young sprouts. After the bark of the pecan becomes more than one year old, it is difficult to work either by budding or grafting.

In conclusion, the writer wishes to urge that the pecan tree deserves more attention than it is now receiving from the people of the South. Its planting should be promoted by sane and conservative business men who have a personal interest in the outcome. Extravagant claims for the industry can only do harm. Very much must be yet learned before we can assert that certain premises with reference to its culture are facts. We need to know very much more definitely than we now know the best regions for the cultivation of each named variety. Experiments for the determination of facts with reference to the productiveness, hardiness and soil requirements of different varieties must extend through a number of years to obtain valuable information, because the pecan naturally does not fruit early. Plant more pecan trees, but be prepared to wait patiently for results. Experiment if you will, but do not make your experiment too large for you to carry it to a successful conclusion.

Mississippi Agricultural Experiment Station.

BULLETIN No. 125

INSPECTION AND ANALYSES OF
COMMERCIAL FEEDING STUFFS

ON SALE IN THE STATE.

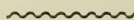


CHEMICAL LABORATORY.

AGRICULTURAL COLLEGE, MISSISSIPPI

NOV. 1909.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



Inspection and Analyses of Feeding Stuffs

BY THE CHEMICAL DEPARTMENT OF THE

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AGRICULTURAL COLLEGE, MISSISSIPPI

THE INSPECTION AND ANALYSIS OF COMMERCIAL FEEDING STUFFS.

Introduction.—The Mississippi feeding stuff law which became effective July 1, 1908, defines the conditions under which feeds can be sold in this state and provides for an official inspection for the protection of purchasers as well as for the benefit of manufacturers of meritorious feeds, who, before the enactment of this law, possessed no means of protecting their business from the unfair competition of lower grade products or mixtures of them. In its main requirements the law is similar to those which have been in force for a number of years in many other states, and feeders, dealers, and manufacturers like are agreed that some form of an efficient system of inspection and regulation of the quality of commercial mixed feeds and feeding stuffs is absolutely essential to the trade.

Guaranties of manufacturers.—This bulletin contains all guaranties which have been filed up to the time of sending it to the press (Nov. 8, 1909).

The average retail selling price of the various brands of feeds and of feed products are given so far as they are known. Feed inspectors record the retail price per ton when a sample is drawn by them, and the averages given here have been made from their reports. Changing market conditions necessarily modify the price of feed from time to time, but these averages possess a comparative significance nevertheless from the standpoint of the purchaser, whose interest demands a careful comparison of the **selling prices** and **analyses** of brands of feed which are offered him.

No feed may be offered for sale, the bags of which do not carry tags giving the composition guaranteed by the manufacturer or seller. The guaranties on these tags should not vary from those given in this bulletin. This matter receives the careful attention of inspectors, and, during the past year, errors in stating guaranteed analyses have not been infrequent. The buyer assumes that the analysis on the tags

is correct, and fair competition between sellers necessitates a true statement of the official guaranty in every case.

Feeding values.—These analyses are published for the benefit of those who buy feeds. The lack of some knowledge of the composition and relative value of feeding materials has certainly resulted in many unwise purchases, and since large sums are now paid out annually for commercial mixed feeds and mill by-products, dealers, farmers, and feeders generally must acquaint themselves with the nutrients in feeds, their relative values, and their proper balance in rations for various purposes, because this information is absolutely necessary for the intelligent feeding of farm stock and for the purchase of adaptable feeds at favorable prices.

It must be admitted that it not infrequently happens that a certain brand or kind of feed is used when a better one may be obtained for less money, but a wiser discrimination cannot be exercised until the buyer studies the subject of feeds and learns how to value them. Merchants, especially for the present, should give this matter the consideration which its importance to their customers demands.

Bulletin No. 123 issued in June of this year contains an elementary discussion of feed nutrients, the amount and digestibility of which in a palatable form fixes the value of all kinds of feeds. Those interested in this trade cannot exercise the best judgment in buying feed supplies until they come to understand the method of estimating their relative values. These nutrients are:

Fat,
Protein, and
Carbohydrates.

If the dry weight of two feeds contains equal amounts of the above in an equally digestible and palatable condition, they are of practical equal value to an animal, and it does not matter greatly what products or mixtures of them supply these nutrients. In short, feeds are bought only for these digestible nutrients and the kinds of grains, by-products, hays, etc., from which they are obtained is of less importance so long as the feed is palatable and adaptable to the animal.

Digestibility.—The value to the animal of feed nutrients depends, of course, on the digestibility of them. Variations in digestibility are sometimes wide.

For example, approximately 90 per cent of the fat of cornmeal, cotton-seed meal, and brewers dried grains is digestible, while the

of hays varies in digestibility, from, say, 40 to 60 per cent. Corn, oats, bran, middlings, cotton-seed meal, and leguminous hays contain protein in forms which are digestible to the extent of approximately 10 per cent. Digestion, co-efficients and the amounts of **digestible nutrients** contained in all common feed materials will be found on pages 16 and 24 of Bulletin No. 123.

Balanced rations.—This subject is also discussed in bulletin 123. The results of many researches by scientific men and of the practical experience of feeders teach us that the amounts of digestible fat, protein and carbohydrates in a feed should bear a certain relation to each other. The requirements, for example, of dry matter and digestible fat, protein, and carbohydrates which an ox or a horse at work, or a good milk cow should receive daily have been determined. These requirements in nutrients are safe guides in feeding; they are not absolute, but these results of study and experiment point the way in which feeds should be mixed for certain animals kept for certain purposes.

The subject of feeding standards has been discussed in a previous publication. The following from the Wolff-Lehman standards are inserted here for convenience:

Table showing total dry-matter and amounts of nutrients required per head and per day for each 1,000 lbs. live weight.

ANIMAL.	Digestible Nutrients				Nutritive Ratio
	Total Dry Matter Lbs.	Protein Lbs.	Carbohydrates Lbs.	Fat Lbs.	
Oxen, at medium work	25	2.00	11.50	0.50	1: 6.50
Oxen at heavy work	28	2.80	13.00	0.80	1: 5.30
Horses at medium work	24	2.00	11.00	0.60	1: 6.20
Horses at heavy work	26	2.50	13.00	0.80	1: 6.00
Milk Cows, 22 lbs. milk.....	29	2.50	13.00	0.50	1: 5.70
Milk Cows, 27.50 lbs. milk	32	3.30	13.00	0.80	1: 4.50

Mixed feeds for horses, mules and oxen at work and for good milk cows and fattening cattle should not contain less than ten per cent of protein.

Inspection.—Feed inspectors are constantly drawing samples from all parts of the state and these are being analyzed.

Two bulletins containing a large number of analyses will be placed in the hands of the printer in a few days.

Almost all manufacturers of feeds are cheerfully complying with the requirements of the law, and, as all feeds are sold under a positive guarantee purchasers can feel reasonably well assured that feeds supplied by various manufacturers will not be found deficient as a general rule. The inspection will bring to light for prompt correction errors and oversights in manufacture.

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
ABBEVILLE RICE MILL OFFICE, Abbeville, Louisiana.					
Rice Bran No. 1	10.00	10.00	35.00	12.00	\$25.00
Rice Polish	6.00	10.00	65.00	10.00	30.00
ALABAMA CORN MILLS COMPANY, Mobile, Alabama.					
"Perfection Feed"	4.53	9.00	71.00	2.96	
Pure Wheat Bran	4.00	14.50	50.00	9.50	
Pure Wheat Shorts	4.00	16.00	48.00	6.42	
ALFALFA FEED MILLS, Nashville, Tennessee.					
Evergreen Feed	3.50	12.00	50.00	12.00	
Mixed Middling Feed	3.50	10.00	50.00	12.00	29.00
Purity Meal	4.00	9.50	62.00	8.00	
ALFALFA MILLING COMPANY, Hobart, Oklahoma.					
Alfarine—Cow and Ox Feed	3.69	13.75	54.28	15.46	
Trueblood's Mixed Feed—Cow and Ox Feed	3.52	15.14	65.92	16.23	
Oxalfa—Cow and Ox Feed	3.50	16.00	63.00	29.00	
ALTUS ALFALFA MILLING COMPANY, Altus, Oklahoma.					
Milo Falo—Cow and Ox Feed	4.00	14.00	52.00	16.00	
AMERICAN MILLING COMPANY, Chicago, Illinois.					
Sucrene Dairy Feed	3.50	16.50	46.00	12.00	28.00
Sucrene Horse and Mule Feed	3.50	10.00	50.00	12.00	32.00
Sucrene Stock Feed	3.50	10.00	50.00	12.00	
Sucrene Alfalfa Horse and Mule Feed	3.50	10.00	50.00	12.00	
ARKADELPHIA MILLING COMPANY, Arkadelphia, Arkansas.					
Bran	3.50	12.00	50.00	12.00	27.50
Shorts	3.50	12.00	50.00	12.00	30.00
"White Sack Feed"	3.69	18.75	54.78	7.37	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
ARLINGTON ROLLER MILLS, Arlington, Kentucky. (FLEGLE BROS., Prop.)					
Bran	4.00	14.00	52.00	9.00	\$
Shorts	4.00	14.00	52.00	9.00	
B. & M. MILLING & ELEVATOR CO., Adams, Nebraska.					
'B. & M.' Corn Products	6.50	7.00	58.00	12.00	
BEATRICE CORN MILLS, Beatrice, Nebraska.					
Pure Hominy Feed	8.00	10.00	60.00	10.00	
BALLARD & BALLARD COMPANY INC., Louisville, Kentucky.					
Ballard's Bran	4.10	14.44	50.00	9.00	
Ballard's Shipstuff	3.75	15.69	55.00	6.87	
C. BECKER MILLING COMPANY, Red Bud, Illinois.					
Bran	3.58	14.50	52.00	10.00	39.00
Shorts	4.20	15.50	60.30	3.70	32.00
BERNET, CRAFT & KAUFFMAN MFG. CO., St. Louis, Missouri.					
Pure Wheat Bran	3.55	14.30	55.20	10.20	
Pure Wheat Middlings	4.95	17.25	57.00	6.15	
* BESHES & JACKSON, Columbus, Kentucky.					
Mixed Feed	4.50	17.50	52.00	9.00	
(* Name changed to Jackson & Ringo)					
MARCUS BERNHEIMER FLOUR MILLS CO., St. Louis, Missouri.					
(Banner) Pure Winter Wheat Bran	4.00	14.50	50.00	9.50	
Pure Winter Wheat Middlings	4.00	15.00	55.00	5.00	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
BILOXI MILLING COMPANY, Biloxi, Mississippi.					
B. M. C. Cow Feed	5.00	10.00	62.55	10.00	\$
B. M. C. Horse Feed	4.00	9.50	70.58	5.00	
THE BLAIR MILLING COMPANY, Atchison, Kansas.					
Blair's Bran					
Blair's Corn Chops	3.50	14.00	54.00	9.50	28.00
Blair's Feed Meal	5.00	10.50	69.60	3.10	
Blair's Mixed Feed	6.50	9.50	60.50	5.50	
Blair's Special Dairy Feed	3.50	15.00	55.00	7.80	
Blair's Shorts	4.00	15.00	61.00	6.00	
	3.50	14.50	56.00	9.00	
BLOOM'S SON COMPANY, New Orleans, Louisiana.					
Rice Bran	8.87	11.44	53.55	9.37	28.00
Rice Polish	4.77	10.13	69.28	2.20	31.00
BRANSFORD MILLS, Owensboro, Ky.					
Bran and Shorts	4.00	15.00	50.00	6.00	
BROWDER MILLING COMPANY, Fulton, Kentucky.					
Bran	5.00	16.75	53.60	8.75	
Mixed Feed	4.25	15.00	54.00	9.00	
E. C. BUCHANAN & COMPANY, Memphis, Tennessee.					
Andes Mixed Feed	4.00	12.18	62.71	5.73	30.00
Wheat Bran	3.75	14.75	50.00	11.00	28.00
Wheat Shorts	4.00	16.50	52.00	6.00	26.75
R. B. BUCHANAN & COMPANY, Memphis, Tennessee.					
Otto Weiss Alfalfa Stock Food	3.77	12.62	59.48	11.56	
Otto Weiss Hen Feed	3.50	13.89	59.28	2.55	
AUGUST J. BULTE MILLING COMPANY, Clinton, Missouri.					
Bran	4.50	14.00	49.00	10.00	
Corn Chops	3.50	10.00	70.00	3.00	
Middlings	4.25	14.00	67.00	1.00	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
CAIN MILLING COMPANY, Atchison, Kansas.					
Cain's Shorts	4.00	15.00	55.00	7.00	\$
Cain's Bran.....	3.75	13.50	51.00	10.50	
CAIRO MILLING CO., Cairo, Ills.					
Purity Bran	4.00	13.40	54.00	10.30	
Pine Leaf Middlings	4.20	15.75	57.95	6.10	
CAPE COUNTY MILLING COMPANY, Jackson, Missouri.					
Pure Soft Winter Wheat Mill Run Mixed Feed	5.54	16.00	55.19	7.44	
Pure Wheat Bran	3.50	11.50	52.00	9.00	27.30
Shorts	3.80	16.12	62.87	3.53	29.00
CAPITAL GRAIN & MILL COMPANY, Nashville, Tennessee.					
Alfacorn	3.50	10.00	54.00	12.00	31.90
Capital Meal	4.00	9.50	62.00	8.00	32.00
Capital Chops.....	4.50	9.00	62.00	10.00	
W. F. CHAMBERLAIN FEED COMPANY, St. Louis, Missouri.					
Chamberlain's Perfect Feed	3.50	10.50	60.00	6.00	
Chamberlain's Premium Feed	3.50	10.50	60.00	6.00	
CHAPIN & COMPANY, St. Louis, Missouri.					
Pure Wheat Bran	3.50	14.00	40.00	10.00	
CHARLESTON MILLING COMPANY, Charleston, Missouri.					
Bran	4.75	13.10	54.50	9.20	26.00
Corn Chops.....	3.65	12.00	64.34	2.87	30.00
Shipstuff	5.20	14.35	60.20	4.50	31.65
CLARK & BURKLE COMPANY, Memphis, Tennessee.					
Puralfa	3.97	15.78	55.06	10.55	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
CLEVELAND BROTHERS, Mobile, Alabama.					
Wheat Bran	3.50	12.00	50.00	10.50	
Wheat Shorts.....	3.50	12.00	50.00	10.50	
H. C. COLE MILLING COMPANY, Chester, Illinois.					
Bran, Product of Pure Soft Winter Wheat	3.50	14.50	50.00	10.00	\$27.00
Middlings, Product of Pure Soft Winter Wheat	4.50	16.00	57.00	5.50	
COLUMBIA STAR MILLING COMPANY, Columbia, Illinois.					
Wheat Bran	3.74	15.26	53.38	9.21	30.00
Wheat Middlings	5.02	15.26	60.47	3.75	31.50
COMMONWEALTH FEED MILLS CO., St. Louis, Missouri.					
Missouri Hen Feed	5.00	11.00	60.00	5.50	
Action Horse Feed Special.....	3.60	12.00	56.00	12.00	
THE CORNO MILLS COMPANY, St. Louis, Missouri.					
Corno Chick Feed	3.50	10.00	70.00	3.40	32.50
Corno Hen Feed	3.70	10.00	70.00	2.30	35.00
Corno Horse & Mule Feed	3.50	10.00	58.50	12.00	33.50
Creamo Dairy Feed—Cow and Ox Feed.....	5.00	14.50	45.00	19.50	33.50
CORYDON MILLING COMPANY, Corydon, Kentucky.					
Famous XX Feed	5.00	14.00	56.00	5.00	
Famous Feed	5.00	14.50	62.00	5.20	
CUMBERLAND MILLS, Nashville, Tennessee.					
Hominy Feed.....	10.00	10.50	50.00	6.31	
Pure Wheat Shorts	4.00	16.00	48.00	6.00	
Pure Wheat Bran	4.00	14.50	50.00	9.50	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
CUNNINGHAM COMMISSION COMPANY, Little Rock, Arkansas.					
Mixed Mill Feed	4.00	13.50	52.00	11.00	
Pulaski Mixed Horse Feed	4.00	12.00	55.00	12.00	26.00
DAHNIKE WALKER MILLING COMPANY, Union City, Tennessee.					
Wheat Bran	3.95	14.00	55.00	10.50	28.85
Wheat Shorts	4.85	13.75	62.00	7.50	31.75
DAVIS & ANDREWS COMPANY, Memphis, Tennessee.					
Hominy Feed	5.00	9.00	60.00	9.00	
Wheat Bran	3.50	10.00	54.00	10.50	28.65
Wheat Shorts	3.50	10.00	54.00	10.50	30.50
DEAN MILL COMPANY, Ava, Illinois.					
Dean Mill Co.'s Pure Wheat "Bran" ..	3.50	14.00	54.00	10.00	
Dean Mill Co.'s Pure Wheat Middlings	4.00	16.00	56.00	8.00	
DRAGO GRAIN COMPANY, Mobile, Alabama.					
Alfalfa Feed	3.67	10.38	64.24	7.32	
DUMAS GROCERY COMPANY, Mobile, Alabama.					
Grainfalfa	3.50	10.00	58.00	11.00	
Wheat Bran	3.50	11.00	48.00	11.00	
Pure Wheat Shorts	3.50	11.00	48.00	11.00	
THE DUNLOP MILLING COMPANY, Clarksville, Tenn.					
Dunlop Milling Co.'s Bran	4.00	14.00	55.00	10.00	30.00
Dunlop Milling Co.'s Middlings	4.00	15.00	60.00	6.00	29.50
EAGLE MILLING COMPANY, Sparta, Illinois.					
Winter Wheat Brand and Wheat Screenings Mixed	3.50	15.00	57.31	7.60	
Winter Wheat Middlings	3.50	14.50	63.98	3.20	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
J. B. EDGAR GRAIN COMPANY, Memphis, Tennessee.					
Manna Hen Feed	3.50	10.00	60.00	5.00	33.75
Ceralfa Stock Feed	4.50	14.00	50.00	11.50	
Manna Alfalfa Horse and Mule Feed ..	4.00	13.00	55.00	11.50	
Ceralfa Stock Feed	4.00	13.00	55.00	11.50	
EDWARDSVILLE MILLING COMPANY, Edwardsville, Illinois.					
Bran	3.50	14.00	54.00	9.05	
Middlings	4.45	16.90	58.80	4.70	
EGGERS MILLING COMPANY, Herrmann, Missouri.					
Wheat Bran	4.50	15.00	54.00	9.25	28.50
EISENMAYER MILLING COMPANY, Springfield, Missouri.					
Pure Soft Wheat Mill Run Feed	4.00	16.19	57.47	7.85	
Pure Soft Wheat Middlings	4.50	15.75	60.00	6.00	
FREEBURG MILLING COMPANY, Freeburg, Illinois.					
Bran	3.50	14.00	54.00	9.50	33.00
Middlings	3.50	13.50	55.00	5.00	31.00
M FORCHHEIMER & COMPANY, Mobile, Alabama.					
Pure Wheat Bran	3.50	14.00	40.00	9.00	
Pure Wheat Shorts	4.00	15.00	50.00	6.50	
FORKED DEER MILLING COMPANY, Dyersburg, Tennessee.					
Forked Deer Milling Company's Bran	3.79	15.47	58.86	7.27	30.00
GEISENBERGER & FRIEDLER, Natchez, Miss.					
Banner Feed	3.75	9.75	63.00	10.50	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
THE A. H. GEORGE COMPANY, Meridian, Miss.					
George's Prepared Cow and Cattle Feed	4.00	11.00	38.00	40.00	21.00
George's Prepared Horse and Mule Feed	4.00	12.00	60.00	46.25	26.00
George's Mixed Rice Shorts	3.50	10.00	50.00	6.50	
J. T. GIBBONS, New Orleans, La.					
Homing Feed	6.50	7.50	66.00	10.00	
Rice Bran	15.00	11.00	39.00	12.00	
Rice Polish	9.50	9.45	63.00	1.50	29.00
Wheat Bran (Western Star)	3.75	13.00	55.50	10.00	31.00
B. F. GLOVER & SON COMMISSION CO., New Orleans, La.					
Rice Bran	12.29	11.25	41.88	11.30	28.00
Rice Polish	10.17	10.53	62.40	1.20	30.00
Wheat Bran	3.58	14.85	54.60	10.00	30.00
Wheat Shorts.....	4.50	14.90	56.80	7.40	31.00
GOOD LUCK MILLS, St. Louis, Mo.					
Good Luck Feed	3.80	10.00	59.20	11.90	32.00
Good Luck Feed (an Alfalfa Mixture) ..	3.80	12.00	58.00	8.90	
Good Luck Mill Feed (Chick and Scratch Size)	3.50	9.00	60.00	6.00	
THE GREAT WESTERN CEREAL COMPANY, Chicago, Ill.					
Sterling Scratch Feed	3.50	11.00	60.00	6.00	
Boss Chop Feed	4.00	9.50	62.00	10.00	31.50
Daisy Dairy Feed	3.50	14.00	60.00	11.00	30.00
Daisy Horse Feed	3.50	12.00	62.00	11.00	30.00
Durham Chop Feed	4.00	9.50	62.00	10.00	32.00
Excelsior Chop Feed	4.00	9.50	62.00	10.00	30.50
Maizefalfa Feed	4.00	12.00	58.00	11.00	
Sterling Chick Feed	3.50	11.00	60.00	5.00	
GREAT WESTERN FEED COMPANY, St. Louis, Mo.					
Purity Horse and Cattle Feed	4.00	11.50	55.00	10.00	30.50
Hen Feed	3.50	10.00	66.79	4.13	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
GULFPORT GRAIN & ELEVATOR COMPANY Gulfport, Miss.					
Eight Wheel Mixed Feed—Cow and Ox Feed	3.50	11.00	39.00	30.00	
Home Mixed Feed	3.50	10.00	55.00	12.00	34.20
GULFPORT GROCERY COMPANY, Gulfport, Miss.					
Big Bucket Cow Feed	3.50	10.00	45.00	25.00	
Kreem Cow and Cattle Feed	3.50	10.00	50.00	18.00	27.50
Mile Post	3.50	10.00	57.50	12.00	
Nek Yok Ox Feed	3.50	10.00	40.00	25.00	27.65
GUTHRIE & COMPANY, Superior, Neb.					
Corn Alfalfa Horse Feed	4.00	12.00	50.00	12.00	
H. L. HALLIDAY MILLING COMPANY, Cairo, Illinois.					
Bran	4.00	14.00	55.00	8.50	28.00
Middlings	3.50	16.00	65.00	1.50	
HANOVER STAR MILLING COMPANY, Germantown, Ill.					
Soft Winter Wheat Bran	4.50	14.35	50.54	8.92	31.00
Soft Winter Wheat Middlings	4.25	14.60	60.05	10.42	
THE HANNAH DISTRIBUTING COMPANY, Jackson, Miss.					
"Alfalfa Lass"	3.50	10.00	56.00	11.00	
Mixed Feed (No brand, plain bags) ...	3.50	10.00	50.00	12.00	28.30
Mixed Feed (Wheat Brand and Shipstuff)	3.50	10.00	50.00	12.00	26.00
Rice Polish	5.50	11.20	52.00	4.00	25.50
Wheat Bran	3.50	10.00	50.00	12.00	31.50
HARDY GRAIN COMPANY, Union City, Tenn.					
Mixed Bran	4.00	12.01	54.02	6.61	29.00
Mixed Shorts	4.03	12.99	60.71	7.39	27.75
Pure Wheat Bran	3.75	14.25	52.00	10.00	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Rot more than Per Cent.	Approximate Average Retail Price per Ton.
JAMES HARPER & SONS, Wichita, Kansas.					
Harper's Mixed Alfalfa Stock Feed	3.50	12.00	56.00	12.00	
HARRIS & COMPANY, Meridian, Miss.					
"Tip Top" Prepared Cattle Feed	3.50	12.50	29.24	33.81	21.80
HARTFIELD & COOK, Memphis, Tenn.					
Wheat Bran	3.57	14.80	54.60	10.00	
Wheat Shorts.....	3.75	15.00	55.00	9.50	
HENRY HOHN & BROTHER, Percy, Ill.					
Middlings	4.00	15.00	55.00	5.00	
Mixed Bran and Screenings from Pure Wheat	3.50	14.50	50.00	10.00	
HEZEL MILLING COMPANY, East St. Louis, Ill.					
Wheat Bran	3.55	14.30	54.00	9.00	
Flour Middlings or Shorts	3.55	15.00	60.00	3.00	
HIGGINSVILLE MILLING COMPANY, Higginville, Mo.					
Shipstuff and Shorts	4.87	18.30	59.68	4.50	
HOOD MILLING COMPANY, Gulfport, Miss.					
Grain Special	3.50	10.25	55.00	12.00	
HUNTER BROTHERS MILLING COMPANY, St. Louis, Mo.					
Pure Wheat Bran	3.50	14.00	54.00	10.00	26.40
Pure Wheat Middlings	4.00	16.00	56.00	9.00	30.00
HUNTER-ROBINSON-WENZ MILLING CO., St. Louis, Mo.					
Pure Wheat Bran	3.50	14.50	50.00	9.50	
Pure Wheat Middlings	4.00	15.00	50.00	6.00	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
HUTCHINSON ALFALFA PRODUCTS CO., Hutchinson, Kan.					
Hapco Horse and Mule Feed	4.00	12.00	58.00	11.00	
ILLINOIS FEED MILLS, St. Louis, Mo.					
Feed-Well Mill					
Feed (Chick and Hen Size)	3.50	10.00	60.00	6.00	40.00
Peck's Mule Feed	3.80	10.00	59.20	11.90	34.30
Star Mill Feed (Chick and Scratch Size)	3.50	10.00	60.00	6.00	33.75
Star Feed	3.80	12.00	58.00	8.90	
INTER-STATE MILLING COMPANY, Memphis, Tenn.					
Oxfude--Cow and Ox	4.50	10.00	45.00	22.00	
Sugaration	3.60	11.65	64.40	11.40	
JONES & ROGERS, Memphis, Tenn.					
Eagle Alfalfa Feed	4.50	13.50	55.00	12.00	
KELLY MILLING COMPANY, Kansas City, Mo.					
"Pure Winter Wheat Bran"	3.50	15.00	53.00	9.00	
"Pure Winter Wheat Shorts"	4.50	17.00	56.00	5.00	30.00
* THE KELLY & LYSLE MILLING CO., Leavenworth, Kan.					
K. & L. M. Co.'s Bran	4.00	15.00	52.00	10.00	
K. & L. M. Co.'s Shorts	4.50	14.50	54.00	8.00	33.00
(* J. C. Lyle Milling Co.)					
KEMPER MILL & ELEVATOR COMPANY, Kansas City, Mo.					
Anchor Bran	4.00	14.50	53.50	9.50	29.00
Carnation Shorts	4.30	16.00	56.25	6.00	
Crescent Shorts	4.25	16.00	53.75	8.00	30.00
Crown Shorts	4.75	16.00	58.00	5.75	
Diamond Bran	4.00	14.50	53.50	9.50	
Rainbow Mixed Feed	4.00	14.75	53.75	9.50	
Shorts	5.25	15.50	61.25	6.25	31.00
Wheat Bran	4.00	14.50	53.50	9.50	29.30

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton
KIMBALL CEREAL COMPANY, Kansas City, Mo.					
Pure Wheat Bran	3.50	14.50	50.00	10.00	\$
Pure Wheat Shorts	3.50	14.50	60.00	3.50	
HENRY A. KLYCE COMPANY, Dyersburg, Tenn.					
Corn Chops	3.50	10.00	60.00	12.00	30.50
HENRY A. KLYCE, Dyersburg, Tenn.					
Corn Chops	5.50	8.50	70.00	5.00	
KOENIGSMARK MILL COMPANY, Waterloo, Ill.					
Wheat Bran	3.50	14.00	54.00	10.00	
Middlings	4.00	16.00	56.00	7.00	30.00
KORNFALFA FEED MILLING COMPANY, Kansas City, Mo.					
Kornfalfa Feed	4.00	12.00	58.00	11.00	33.00
CHAS. A. KRAUSE MILLING COMPANY, Milwaukee, Wisc.					
Badger Dairy Feed	3.50	16.00	50.00	12.00	
Badger Stock Feed---Cow and Ox	4.00	10.00	50.00	14.00	
LANGENBERG HAY & GRAIN CO., New Orleans, La.					
Pure Winter Wheat Bran	3.50	14.00	54.00	10.00	
H. T. LAWLER MILLING & TRADING CO., New Orleans, La.					
Fat Stock Pure Wheat Bran	3.50	14.00	50.00	10.00	
LAWRENCE BROS. COMPANY, LT'D., Crowley, La.					
Rice Polish	10.50	11.39	61.55	1.75	
LAWRENCE & HAMILTON FEED COMPANY, LTD., New Orleans, Louisiana.					
Stafolife	6.00	11.00	53.00	12.00	32.30

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
LEXINGTON FLOURING MILLS, Lexington, Mo.					
Corn Chops.....	3.87	9.63	55.28	3.78	\$
Wheat Bran	3.57	13.57	51.95	11.48	
Wheat Shorts.....	5.77	16.55	58.01	4.33	
LIBERTY MILLS, Nashville, Tenn.					
Hominy Feed.....	10.00	10.50	50.00	6.31	30.00
Pure Wheat Bran	4.00	14.50	50.00	9.50	
Pure Wheat Shorts	4.00	16.00	48.00	6.00	
LOUISIANA FEED PRODUCTS COMPANY, Baton Rouge, La.					
Louisiana Dairy Feed.....	3.50	17.00	45.00	12.00	
Louisiana Horse Feed	3.50	10.00	55.00	12.00	
LOTTERHOS & HUBER COMPANY, Crystal Springs, Miss.					
Rice Polish	7.00	9.50	50.00	8.00	
LUKENS MILLING COMPANY, Atchinson, Kans.					
Bran	3.50	11.00	50.00	12.00	27.00
Shorts	4.00	13.00	55.00	9.00	
MAJESTIC MILLING COMPANY, Aurora, Mo.					
Pure Wheat Bran	3.75	14.60	55.00	8.00	30.00
Pure Wheat Shorts	3.75	15.00	60.00	3.50	
GEO. B. MATTHEWS & SONS, New Orleans, La.					
(Diamond M) Cow Feed Meal	3.50	10.00	45.00	10.00	31.50
(Diamond M) Pure Wheat Bran	3.50	12.00	45.00	9.50	
(Diamond M) Rice Polish	5.00	10.00	50.00	12.00	
McINNIS & STURGES, Meridian, Miss.					
Mixed Chop Feed	3.50	10.00	60.00	12.00	

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
MEEK MILLING COMPANY, Marissa, Ill.					
Pure Wheat Bran and Ground					
Wheat Screenings	3.50	13.50	50.00	12.00	\$30.00
Pure Wheat Shorts	3.50	13.50	54.00	8.50	36.25
JOHN F. MEYER & SONS MILLING CO., Springfield, Mo.					
"Albatross Bran"	3.65	14.75	52.00	10.50	28.25
"Albatross Feed"	3.50	14.00	54.50	10.00	
"Albatross Middlings"	4.00	14.00	63.00	3.50	
"Model Feed"	3.50	14.50	54.00	8.50	
MERTZ-IBACH PRODUCE & GRAIN CO., Mobile, Ala.					
Pure Wheat Bran	3.50	10.00	52.00	10.00	
Pure Wheat Shorts	4.00	11.50	50.00	9.00	
McINNIS & STURGIS, Meridian, Miss.					
"McInnis & Sturgis Chops"	3.50	10.00	60.00	12.00	28.10
McLAUGHLIN COAL & GRAIN COMPANY, Memphis, Tenn.					
Chickasaw Horse and Mule Feed	4.00	14.00	58.47	9.00	
McMILLIAN & HARRISON, Mobile, Ala.					
Wheat Bran	3.50	12.50	50.00	10.50	
MILLSTADT MILLING COMPANY, Millstadt, Illinois.					
No Brand (Bran)	3.50	11.27	59.54	6.04	33.00
No Brand Middlings	3.50	12.35	72.80	1.23	30.00
Palace Horse Feed	3.51	11.81	59.96	11.80	
MOHLENBROCK MILLING COMPANY, Campbell Hill, Ill.					
Mohlenbrock's Bran	3.50	11.00	40.00	11.00	
Mohlenbrock's Shorts	3.50	13.00	40.00	8.00	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				Approximate Average Retail Price per Ton.
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	
R. P. MOORE MILLING COMPANY, Princeton, Indiana.					
King Mixed Feed	4.00	15.00	45.00	9.00	
NASHVILLE ROLLER MILLS, Nashville, Tenn.					
Pure Wheat Bran	4.00	15.00	60.00	9.00	
Pure Wheat Shorts	4.00	15.00	57.00	6.00	
NEW ATHENS MILLING COMPANY, New Athens, Ill.					
Bran and Wheat Screenings	3.50	14.00	55.00	9.50	\$35.00
Middlings	3.50	13.50	55.00	8.00	
NEW IBERIA RICE MILL, New Iberia, La.					
Rice Polish	9.22	10.19	62.97	1.25	
NORTH WEST MILLS COMPANY, Winona, Minn.					
"Sugarata" Chicken Feed	3.50	12.00	50.00	12.00	
"Sugarata" Dairy Feed	4.50	18.00	50.00	12.00	
"Sugarata" Horse Feed	3.50	12.00	56.00	12.00	
NUTRILINE MILLING COMPANY, Crowley, La.					
Nutrine Stock Feed	3.50	12.00	58.00	10.00	32.00
"Momylk" Dairy Feed	3.50	18.00	48.00	10.00	
OKLAHOMA MILL COMPANY, Kingfisher, Okla.					
Mill Run Wheat Bran	3.50	15.00	50.00	9.00	
PEASE & DWYER COMPANY, Memphis, Tenn.					
Optime	4.52	12.85	60.35	6.72	
PINCKNEYVILLE MILLING COMPANY, Pinckneyville, Ill.					
Pure Winter Wheat Bran	3.50	10.00	54.50	12.00	
Pure Winter Wheat Shorts	3.50	10.00	56.50	12.00	30.00

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrites Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
GEO. P. PLANT MILLING COMPANY, St. Louis, Mo.					
Pure Wheat Bran	4.50	16.00	54.00	9.00	\$28.50
Pure Wheat Middlings	4.41	17.11	59.18	5.18	35.00
H. DA PONTE & COMPANY, New Orleans, La.					
Ricepolish.....	8.00	12.00	65.00	3.00	
Rice bran	9.00	11.00	45.00	12.00	
THE QUAKER OATS COMPANY, Chicago, Ill.					
Blue Ribbon Scratching Grains	3.50	10.50	64.00	4.50	
Banner Feed.....	3.75	9.75	63.00	10.50	32.00
Blue Ribbon Feed.....	3.75	9.75	63.00	10.50	31.00
Blue Ribbon Little Chick Feed.....	3.50	10.50	67.00	3.00	
Quaker Little Chick Feed	3.50	10.50	67.00	3.00	
Quaker Scratching Grains	3.50	10.50	64.00	4.50	
Schumaker Little Chick Feed	3.50	10.50	67.00	3.00	
Schumaker Scratching Grains.....	3.50	10.50	64.00	4.50	
Victor Feed	3.75	9.75	63.00	10.50	
Schumacher Special Horse Feed.....	4.00	10.00	62.00	8.00	
Molac Horse Feed	3.50	10.00	60.00	10.50	
Vim Horse Feed	3.50	10.00	60.00	10.50	
Schumacher Stock Feed.....	4.00	10.00	62.00	10.00	
Cracker Mule Feed	3.50	10.00	58.00	12.00	
Quaker Dairy Molasses Feed	3.50	16.00	50.00	12.00	
RALSTON PURINA COMPANY, St. Louis, Mo.					
Peerless Alfalfa Feed	3.80	12.00	58.00	8.90	
Peerless Feed	3.80	10.00	59.20	11.90	
Protena Feed (an Alfalfa mixture).....	3.80	12.00	58.00	8.90	31.00
Protena Dairy Feed--Cow and Ox	3.50	20.00	48.00	16.00	33.00
Purina Feed	4.00	12.50	58.00	8.90	32.87
Purina Mash	3.50	17.00	44.00	11.50	
Purina Mill Feed (Chick and Scratch size)	3.60	11.00	65.00	4.00	41.00
Purina Pigeon	3.60	11.00	65.00	4.00	
Success Mill Feed (Chick and Scratch size)	3.50	9.00	60.00	6.00	
Pure Wheat Bran	4.00	16.00	59.00	6.00	
RANDOLPH MILLING COMPANY, Baldwin, Ill.					
"Randolph Bran"	3.50	14.50	50.00	10.62	
"Randolph Middlings"	3.50	16.00	56.00	5.50	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
RAUCH MILLING COMPANY, Belleville, Ill.					
Bran	3.50	10.00	55.00	12.00	\$31.00
REA-PATTERSON MILLING COMPANY, Coffeeville, Kan.					
Bran	3.50	14.52	55.96	8.50	26.80
Mixed Feed	3.50	14.52	57.33	7.90	
Shorts	3.94	15.22	61.02	4.25	
REFUGE COTTON OIL COMPANY, Columbus, Miss.					
"Mr. Durham" Cow and Ox Feed	3.50	13.00	50.00	20.00	
Perfection Horse Feed (Cow and Ox Feed)	4.00	12.00	50.00	15.00	
Plow Boy Stock Feed (Cow and Ox Feed)	4.00	13.00	50.00	15.00	
REICHERT MILLING COMPANY, Freeburg, Ill.					
Fancy Middlings	4.00	16.00	56.00	8.00	
Wheat Bran	4.00	15.50	55.00	9.00	32.50
RELIAANCE MILLING COMPANY, Kenton, Tenn.					
Wheat Shorts	4.00	15.00	65.00	6.00	
Wheat Bran	4.08	15.62	56.43	7.86	
ROBINSON-DANFORTH COMPANY, St. Louis, Mo.					
Regal Mixture Mill Feed (Chick and Scratch size)	3.50	9.00	60.00	6.00	
Winner Mill Feed (Chick and Scratch size)	3.50	9.00	60.00	6.00	
ROBERTS & HAMNER GRAIN COMPANY, Memphis, Tenn.					
"Premium"	5.00	13.00	51.00	5.50	37.00
Graino	4.00	12.00	54.00	10.00	
RUTHERFORD MILLING COMPANY, Rutherford, Tenn.					
Mill Run Bran	4.30	13.40	57.70	8.00	26.00
Pure Wheat Middlings	5.10	16.70	59.70	5.00	

TABLE I.—Analyses of Commercial Feeding Stuff

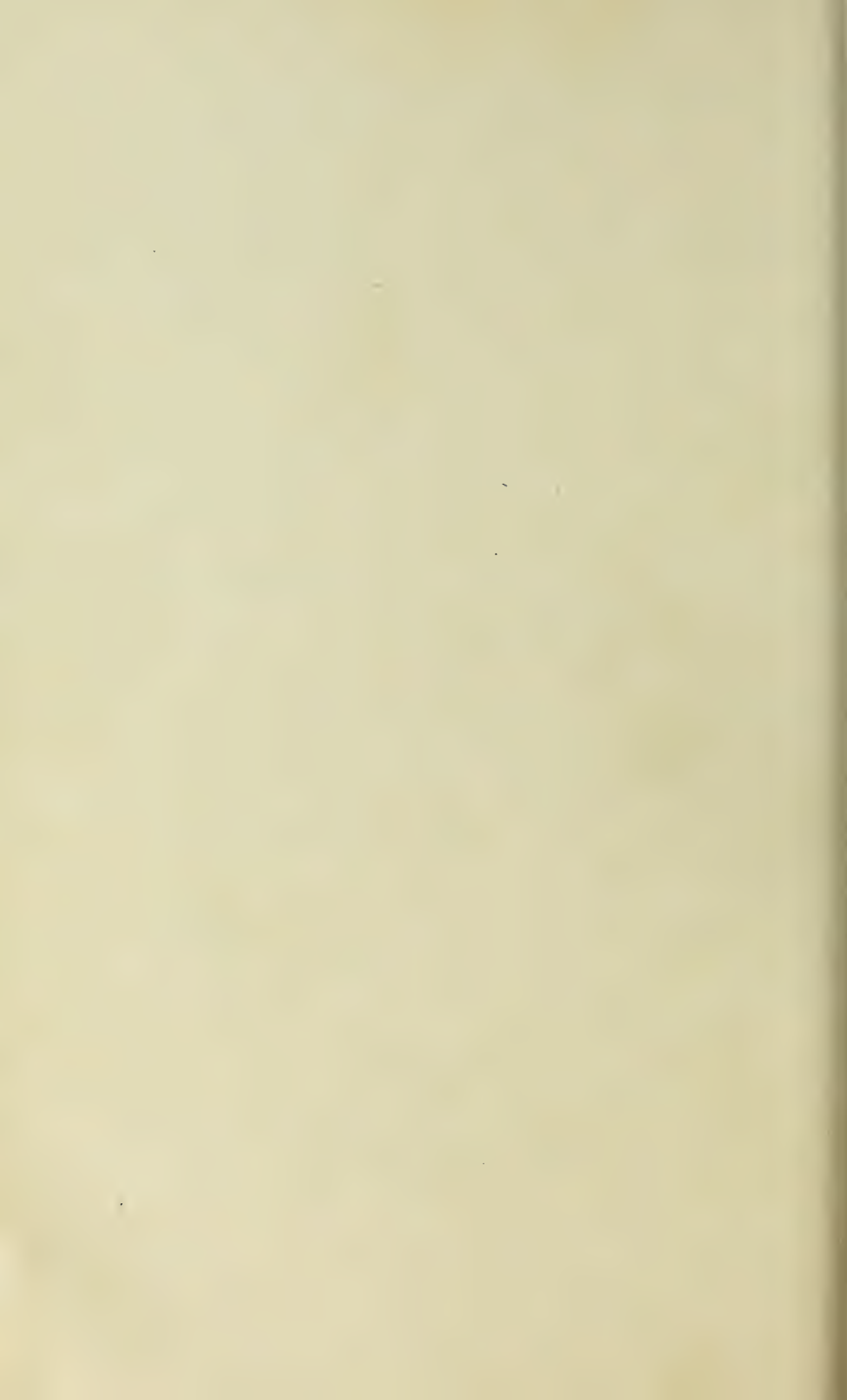
NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
SAXONY MILLS, St. Louis, Mo.					
Wheat Bran	3.50	12.00	52.00	10.00	
No. 1 Brown Wheat Middlings	4.00	15.00	55.00	8.00	
SAUERS MILLING COMPANY, Evansville, Ill.					
Bran	3.50	14.26	55.18	8.80	
Shipstuff	4.20	14.96	60.10	4.92	
N. SAUERS MILLING COMPANY, Cherryvale, Kan.					
Wheat Bran	3.95	15.00	53.10	11.65	\$32.00
SCOTT COUNTY MILLING COMPANY, Sikeston, Mo.					
Pure Wheat Bran	4.00	14.15	55.00	9.00	26.50
Pure Wheat Middlings	5.93	16.27	61.60	4.50	
NICHOLAS SCHROFF & SONS GROCER CO., St. Louis, Mo.					
Jockey Brand Crushed Feed	4.00	12.50	58.00	8.90	
HENRY B. SCHREIBER & BROTHER, New Orleans, La.					
Cow Feed Meal	3.50	10.00	45.00	10.00	
Pure Wheat Bran	3.50	12.00	45.00	9.50	
SHANKS PHILLIPS & COMPANY, Memphis, Tenn					
Pure Wheat Bran	3.50	10.00	50.00	12.00	
Pure Wheat Shorts	3.50	10.00	50.00	12.00	
SIEWERD MILLING COMPANY, LTD., New Orleans, La.					
Polish	6.25	11.37	62.88	2.50	
SLIDELL GROCERY & GRAIN COMPANY, Slidell, La.					
Wheat Bran	3.50	14.00	53.00	10.00	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
SPARKS MILLING COMPANY, Alton, Ill.					
"TryMe"	4.25	15.00	50.00	10.00	\$
STANARD-TILTON MILLING COMPANY, St. Louis, Mo.					
Bran	3.50	14.00	54.00	10.00	
Middlings	5.00	16.00	40.00	7.00	
STEELVILLE MILLING COMPANY, Steelville, Ill.					
Steelville Bran	3.50	14.50	50.00	10.00	30.00
Steelville Middlings	4.00	15.00	55.00	5.00	
STEINMESCH FEED & POULTRY SUPPLY COMPANY, St. Louis, Mo.					
Steinmesch Chick Feed	3.50	12.00	59.00	6.00	
Steinmesch Hen Feed	3.50	11.00	60.00	4.00	
Steinmesch Early Breakfast Mash	4.00	15.00	46.00	10.00	
ST. MARY'S MILL COMPANY, St. Mary's, Mo.					
Middlings	4.20	15.81	62.37	2.90	36.00
Soft Winter Wheat Bran	3.56	15.06	54.70	8.93	31.30
TAYLOR-GREER GRAIN COMPANY, Memphis, Tenn.					
Pure Wheat Bran	3.50	14.00	54.00	12.00	
Pure Wheat Middlings	5.00	16.00	40.00	8.00	
TENNESSEE FIBER COMPANY, Memphis, Tenn.					
Cremo Brand Feed Meal	5.00	20.00	36.00	25.00	
THREEFOOT BROTHERS & COMPANY, Meridian, Mississippi.					
Rice Polish	10.00	10.50	56.00	2.00	31.00
Rice Polish and Bran	5.00	9.25	61.00	8.50	
JACK TRAUTMAN & COMPANY, New Orleans, La.					
Rice Polish	6.25	9.62	69.22	1.20	30.00

TABLE I.—Analyses of Commercial Feeding Stuffs

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
TROY ROLLER MILLS, Troy, Tenn.					
Trojan Bran.....	4.05	11.10	56.12	7.50	\$
UNIVERSAL STOCK FOOD COMPANY, Lebanon, Tenn.					
Universal Dairy Feed	5.25	22.50	42.00	12.00	
Universal Horse & Mule Feed.....	4.75	11.50	52.00	12.00	
VALLEY MILLING COMPANY, St. Louis, Mo.					
Acme	4.00	9.50	55.00	12.00	
Delta	5.00	8.50	50.00	12.00	32.00
Gano Feed	4.50	9.00	50.00	12.00	
VALIERS & SPIES MILLING CO., Marine, Ills.					
Valier's Bran	3.50	14.50	50.00	5.00	
Valier's Middlings	5.00	16.00	50.00	4.00	
Valier's Mixed Feed	4.00	15.00	50.00	5.00	
JOHN WADE & SONS, Memphis, Tenn.					
Wade's Alfalfa Feed	6.03	11.33	55.15	11.31	
Pure Wheat Bran	3.50	10.00	50.00	12.00	30.00
Purity Feed	4.25	9.25	65.00	5.50	35.50
Pure Wheat Shorts	3.50	10.00	50.00	12.00	32.00
WASHBURN CROSBY CO., Minneapolis, Minn.					
Coarse Bran (unadulterated wheat).....	4.00	14.50	50.00	11.00	
Standard Middling (unadulterated wheat).....	4.00	15.00	55.00	8.00	
Flour Middlings (unadulterated wheat)	5.00	17.00	55.00	6.00	
Adrian (unadulterated wheat--- Red Dog flour)	5.00	17.00	60.00	4.00	
WATERLOO MILLING COMPANY, Waterloo, Ill.					
Bran	4.00	15.00	50.00	8.25	
Middlings	4.00	15.00	60.00	4.00	
Mixed Feed	4.00	15.00	50.00	8.25	

NAME OF COMPANY AND BRAND REGISTERED.	GUARANTEED TO CONTAIN.				
	Crude Fat Per Cent.	Crude Protein Per Cent.	Carbohydrates Per Cent.	Crude Fiber Not more than Per Cent.	Approximate Average Retail Price per Ton.
WEBB & MAURY, Memphis, Tenn.					
I. X. L. Cow and Ox Feed	3.50	10.00	40.00	15.00	
Memphi Stock Feed	3.50	10.00	40.00	12.00	34.00
Pure Wheat Bran	3.50	10.00	50.00	12.00	32.50
Pure Wheat Shorts	3.50	10.00	50.00	12.00	34.00
J. H. WILKES & COMPANY, Nashville, Tenn.					
Sunshine Scratch Food	3.73	10.31	71.90	3.21	
WOLFF MILLING COMPANY, New Haven, Mo.					
Bran with Screenings	3.50	14.00	52.00	11.00	
Middlings	3.75	15.50	55.00	6.00	
YATES & DONELSON COMPANY, Memphis, Tenn.					
Feed Meal	6.90	10.10	64.25	6.60	32.00
Wheat Bran	3.58	14.85	54.60	10.00	35.00
Wheat Bran mixed with Corn Bran	3.70	13.25	57.15	10.00	26.30
G. ZIEBOLD & SON, Red Bud, Ill.					
Wheat Shorts	4.00	15.00	56.00	7.00	
Wheat Bran	3.50	14.50	55.00	9.00	
J. ZIMMERN'S COMPANY, Mobile, Ala.					
Pure Wheat Bran	4.00	14.75	50.00	9.60	
Pure Wheat Middlings	4.00	17.00	59.40	4.60	
Pure Ground Alfalfa, Molasses, Corn and Oats	3.90	10.25	55.17	7.65	
Zimmern's Pure Ground Corn & Oats	4.00	10.38	58.90	3.20	
Zimmern's Alfalfa, Corn and Oats	4.00	10.06	54.88	3.48	



Mississippi Agricultural Experiment Station
Agricultural College, Mississippi.

BULLETIN No. 126.

INSPECTION AND ANALYSES
OF COMMERCIAL FERTILIZERS

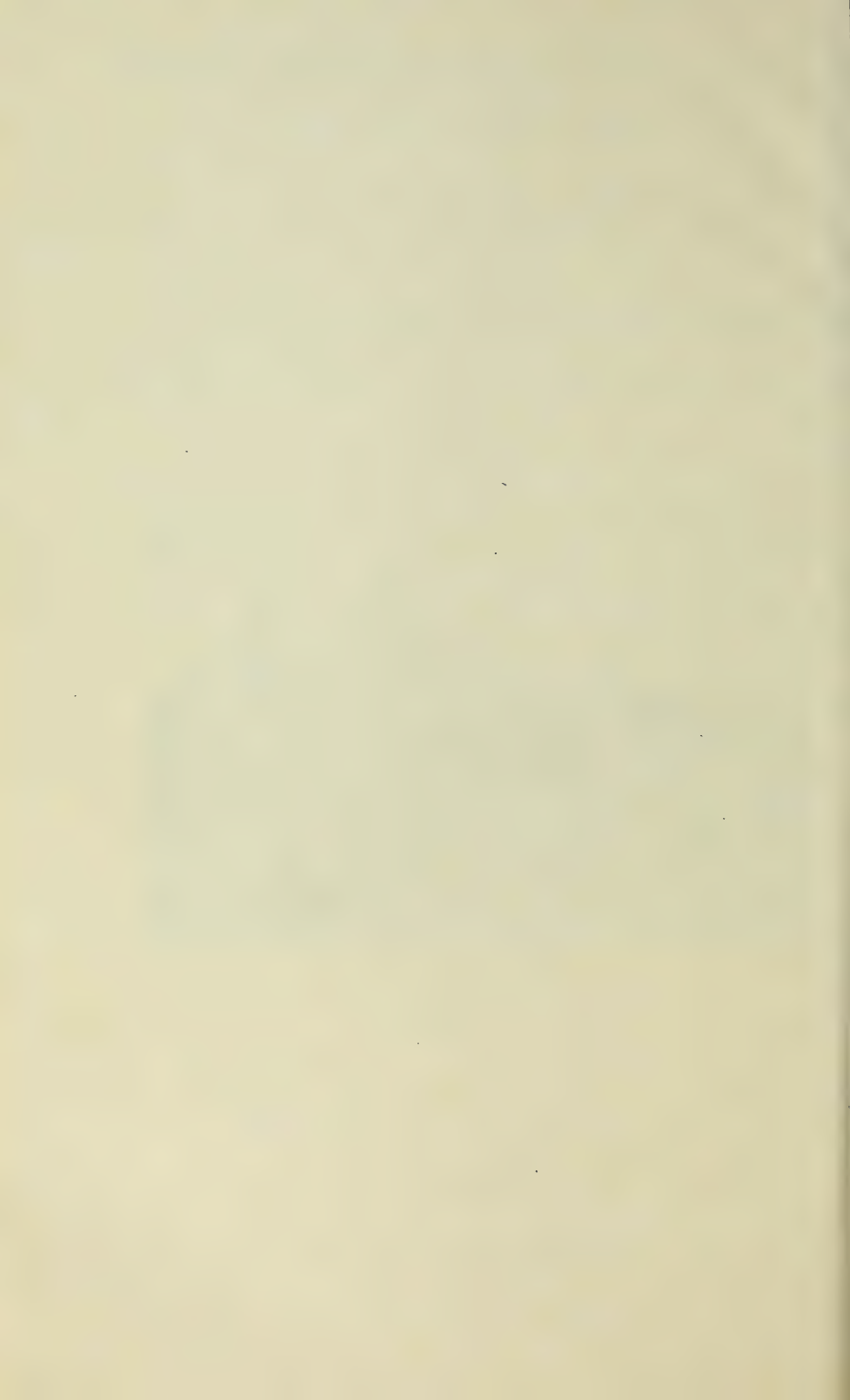
ON SALE IN THE STATE.



CHEMICAL LABORATORY.

AGRICULTURAL COLLEGE, MISSISSIPPI

NOVEMBER, 1909.



MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



Inspection and Analyses of Fertilizers

BY THE CHEMICAL DEPARTMENT OF THE

Mississippi Agricultural and Mechanical College.



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STATE CHEMICAL LABORATORY

Agricultural College, Mississippi.

THE INSPECTION AND ANALYSES

OF

COMMERCIAL FERTILIZERS.

Introduction.—This bulletin reviews the inspection of fertilizers and fertilizer materials during the season of 1908-1909. It has been preceded by circulars Nos. 27, 28 and 29, issued from time to time as the inspection progressed. An especial effort is made to distribute these circulars promptly during those months in which the trade is most active, that buyers and sellers of fertilizer may have at hand accurate data in regard to the composition of the goods of the current season. The distribution is so rapid in January, February and March that it is not usually practicable to have reports of analyses reach dealers before consignment sampled has been sold. The bulk of the fertilizer business in this state is done in about ninety days, and during this time, the especial attention of all inspectors of the Department is given to this trade, though a careful inspection is maintained, of course, throughout the season.

Drawing samples.—The efficiency and fairness of an inspection of this kind depend primarily, of course, upon the representative character of the samples analyzed. The publication and wide distribution of these analyses directs the attention of the trade to the quality of the goods which are supplied under the various brand names, and it is evident, therefore, that the utmost care should be exercised to avoid errors in taking samples and inaccuracies in analyzing them.

Manufacturers not infrequently complain that samples showing deficiencies on analysis do not fairly represent their goods, and offer in evidence frequent analyses of their private laboratories showing that no deficiencies could be detected before shipments were made. It is plain that great difficulties are encountered in producing reasonably homogeneous mixtures in such large amounts, but the average of the results of a large number of analyses of carefully drawn samples should certainly closely approximate the true composition of the fertilizer which reaches the farmer.

The Department wishes to throw every practical safeguard around the taking of these samples and to use every reasonable means of preventing errors in the analytical work. If an analysis is unsatisfactory to a manufacturer, a portion of the sample will be supplied for examination by his chemist, and, if an error in our work can be established, it will be speedily corrected. It is the practice of analysts in this laboratory to redetermine a constituent if the percentage found in the first analysis is materially below that guaranteed.

During the season of 1909-1910 no samples will be drawn from less than twenty-five bags. Heretofore twenty bags have been sampled as a general rule. Inspectors use a common type of sampling instrument. This is long enough to pass almost through a bag, and the relative location of the puncture is changed with each bag sampled. The material withdrawn by the sampler is carefully mixed, and a portion prepared in this way is preserved in glass bottles.

Goods which have been exposed to the weather or stored in warehouses where damage from rain or other causes is likely to occur are not sampled unless inspectors assure themselves that no damage has occurred. Fertilizers which have been rebagged are not sampled, and this applies also to shipments carried over by dealers from one season to another.

If inspectors find that bags of fertilizer representing two or more brands have been indiscriminately stacked together in a warehouse, no sample will be drawn unless the brand name on each bag sampled can be plainly seen.

If a few bags in a consignment being examined are found to contain a mixture of unusual appearance, they may be omitted by inspectors, but this cannot be done, of course, if a considerable number of bags give evidence of improper mixing. In short, the Department desires to have these samples drawn and analyzed so carefully that injustices cannot frequently grow out of this system of fertilizer inspection.

Registrations.—The number of brands of fertilizer on sale in this territory, fortunately, is small when compared with those offered the trade in other states. There is no necessity of multiplying brand names uselessly. In no other state are so many analyses of samples representing single brands published. The distribution of the greater part of the analytical work among a comparatively small number of brands ought to be more satisfactory to the public and to manufacturers, because of the practical certainty of fair representation in these bulletins. This could not be the case if, as in some states, the

sale of a thousand brands or more renders the analysis of more than a few samples of each entirely impracticable. Manufacturers are urged, therefore, not to file a greater number of guaranties than the necessities of their business require.

Low grade fertilizers.—Farmers are almost continually reminded that low grade fertilizers should be avoided. These cheap mixtures have nothing to commend them to those who would create a demand for them except their apparent cheapness. However, it is safe to assume that this cheapness is only apparent, because the cost to the user of the actual plant food contained in cheap fertilizers (which are of poor quality necessarily) is certainly not less than that of the same amount of plant food in goods of a higher grade.

No "Off Grade" fertilizer should be sold in this state. Dealers should not handle them because they happen to carry a more attractive margin of profit, and manufacturers should not make them, because those who understand their business know that farmers should not buy them.

If a purchaser desires a complete fertilizer he should seek a good one. The sale of a mixture consisting of acid phosphate with small amounts of materials supplying nitrogen and potash should be discouraged by all dealers and makers who have the best interests of the business at heart.

Complete fertilizers should be guaranteed to contain not less than 1.65 to 2.00% of nitrogen and 1.50 to 2.00% of potash.

Mixtures containing, e. g., 0.82% of nitrogen certainly cannot be advised. These cheap fertilizers can find no extensive market except that resulting from incorrect ideas in regard to actual plant food values, and they have some tendency to demoralize the trade in meritorious goods.

Purchase of fertilizers.—When a purchaser wisely determines that he will not buy a low grade fertilizer at any price at which it can be sold, he should exercise care in selecting his supplies from among the brands of standard grade and high grade goods. The price per ton of the fertilizer is not his first consideration. A fertilizer at \$25.00 per ton may be cheaper than one at \$18.00. The cost per **pound** of the plant food must be ascertained.

A ton of acid phosphate containing 12% of available phosphoric acid consists of 240 lbs. of phosphoric acid for which it is valued, and 1,760 lbs. of material for which the purchaser has no special use. If

this acid phosphate is bought for \$12.20 a ton, the purchaser pays \$12.20 for 240 lbs. of phosphoric acid, or 5c per pound.

A ton of 16.50% acid phosphate contains 330 lbs. of phosphoric acid, which at 5c per pound, would make this grade of phosphate worth \$16.50 a ton. One of these grades, on above basis, is as cheap as the other, though, of course, there would be less expense in distributing the higher grade product, 1,454 lbs. of which contains as much phosphoric acid as 2,000 lbs. of the lower grade phosphate.

In a similar way the values of fertilizers containing nitrogen and potash, in addition to phosphoric acid, may be compared. Assuming that the materials supplying the three valuable constituents are of approximately, equal availability, these comparisons of the money value of the plant food in various grades of fertilizer can be easily made if the price of each pound of phosphoric acid, of nitrogen, and of potash is approximately known. The prices used in computing the relative values in this bulletin are given in the following:

	Schedule of values:	per lb.	per unit.
For Nitrogen.....		20c	\$4.00
For Water Soluble Phosphoric Acid in mixed goods		6c	1.20
For Citrate-Soluble Phosphoric Acid in mixed goods		5½c	1.10
For Water-Soluble Phosphoric Acid in plain Acid Phosphates		5½c	1.10
For Citrate-Soluble Phosphoric Acid in plain Acid Phosphates		5c	1.00
For total Phosphoric Acid in fine bone		3c	.60
For total Phosphoric Acid in med. and coarse bone ..		2½c	.50
For Potash		5¾c	1.15

The above figures possess a comparative significance only, but they are intended to approximate the relative market values of the valuable constituents of fertilizers; actual retail prices are controlled, of course, entirely by conditions of the market from time to time.

Further illustrations of relative values of fertilizers.—For the purpose of illustrating somewhat more fully the comparative values of several grades of fertilizer, we may prepare three mixtures by using the following materials in the amounts given:

	Mixture No. 1	Mixture No. 2	Mixture No. 3
14% Acid Phosphate, lbs.	1200		
16.50% Acid Phosphate, lbs.		1310	
18% Acid Phosphate, lbs.			1500
6.30 % Cotton-seed Meal, lbs.	525		
13% Dried Blood, lbs.		145	200
15 % Nitrate of Soda, lbs.		145	180
12½% Kainit, lbs.	275	400	
50% Sulphate of Potash, lbs.			120
Totals—Lbs.	2000	2000	2000

By mixing these raw materials in the above way we will secure three grades of fertilizer. No. 2 is approximately 25% better than No. 1, No. 3 is 50% better than No. 1 and, of course, about 25% better than No. 2. The plant food, etc., in a ton of each is as follows:

	Mixture No. 1	Mixture No. 2	Mixture No. 3
Pounds of plant food in a ton of	253	306	383
Pounds of material of no especial value in a ton of	1747	1694	1617
Totals—Lbs.	2000	2000	2000

These fertilizers contain phosphoric acid in two forms, and also nitrogen, and potash, and their relative market values may be ascertained by multiplying the number of pounds of each valuable constituent in a ton by the price per pound (as given on page 7) and taking the sums of the products for each grade. The following tables show the approximate analysis of these mixtures and illustrate the method of computing the relative commercial values of them.

Mixture No. 1.

CONSTITUENTS.	Per Cent.	Pounds per 100 lbs. of Fertilizer.	Pounds per Ton.	Price per Pound.	Value per Ton.
Water-Soluble Phos. Acid.	6.00	6.00	120	6c	\$7.20
Citrate-Soluble(reverted) Phos. Acid	3.00	3.00	60	5½c	3.30
Nitrogen	1.65	1.65	33	20c	6.60
Potash	2.00	2.00	40	5¾c	2.30
Totals.....	12.65	12.65	253		\$19.40

Mixture No. 2.

CONSTITUENTS.	Per Cent.	Pounds per 100 lbs. of Fertilizer.	Pounds Per Ton.	Price per Pound.	Value per Ton.
Water-Soluble Phos. Acid	7.50	7.50	150	6c	\$9.00
Citrate Soluble (reverted) Phos. Acid	3.30	3.30	66	5½c	3.63
Nitrogen	2.00	2.00	40	20c	8.00
Potash	2.50	2.50	50	5¾c	2.88
Totals.....	15.30	15.30	306		\$23.51

Mixture No. 3.

CONSTITUENTS.	Per Cent.	Pounds per 100 lbs. of Fertilizer.	Pounds Per Ton.	Price per Pound.	Value per Ton.
Water-Soluble Phos. Acid	10.00	10.00	200	6c	\$12.00
Citrate-Soluble (reverted) Phos. Acid	3.50	3.50	70	5½c	3.85
Nitrogen	2.50	2.50	50	20c	10.00
Potash	3.00	3.00	60	5¾c	3.45
Totals.....	19.00	19.00	380		\$29.30

The above simple computations make it plain that if,

Mixture No. 1 is worth.....\$19.40

Mixture No. 2 is worth..... 23.51

Mixture No. 3 is worth..... 29.30

These mixtures contain the valuable constituents in approximately the same relative proportions and the application of

200 lbs. per acre of No. 1 will supply...25.3 lbs. plant food.

200 lbs. per acre of No. 2 will supply...30.6 lbs. plant food.

200 lbs. per acre of No. 3 will supply...38.3 lbs. plant food.

And 165 pounds of No. 2 equals 200 pounds of No. 1.

132 pounds of No. 3 equals 200 pounds of No. 1.

A very casual consideration of the foregoing data is sufficient to illustrate the wide variations which may occur in fertilizers, and to emphasize the necessity of making purchases, not on the price per ton only, but on the basis of actual amount of plant food in a ton, since we have seen that even the best mixtures consists of 80% or more of material which would not be bought at all if it could be avoided. If the valuable plant food constituents in high grade goods can be obtained at approximately the same price per pound as those in mixtures of standard or lower grade, the high grade fertilizer can be handled more economically, and it should be bought though the price per ton is necessarily more.

GENERAL RESULTS OF THE INSPECTION

SEASON 1908-1909

Analyses.—This bulletin contains a somewhat larger number of analyses than was made last year, though the total number of tons of fertilizer sold in the state is somewhat less.

The following classification will illustrate the distribution of the analytical work during the past three seasons:

SAMPLES OF	Season of 1906-1907	Season of 1907-1908	Season of 1908-1909
Complete fertilizers	355	345	358
Acid phosphates	123	148	174
Acid phosphates with potash	9	4	
Acid phosphates with nitrogen			2
Ground bones	5	3	4
Potash salts	14	24	26
Miscellaneous samples		2	5
Official (manufacturers') samples	244	294	311
Totals.....	750	820	880

Distribution of analytical work.—Inspectors collect a large number of samples during the season, and it is impracticable, as it is also unnecessary, to make an analysis of each sample. In this bulletin the more popular brands of fertilizer are represented by a large number of analyses, and this work is distributed throughout the fertilizer territory. Samples cannot be analyzed each year from every dealer who handles fertilizer, but several analyses of samples collected from a single dealer are not published if this procedure can be avoided.

Dealers or farmers who desire analyses of special samples drawn from goods in their possession can always obtain them by making a request for the results. The Department, naturally, desires to co-operate in every helpful way with those interested in the fertilizer trade.

General review of results.—The especial attention of the trade is invited to tables I and II, on pages 16 and 18 which contain a general

analysis of the results of the inspection of the goods sold by each manufacturer doing business in this state.

The following table is a condensed comparative statement, summarizing deficiencies:

Comparative Statement.

SEASON OF	Number of Tons sold in State.	Number of In- spectors' Sam- ples Analyzed.	Number of Samples below Guarantee in Relative Value.	Percentage be- low Guarantee in Relative Val.	Percentage as much or more than 3% below in Relative Val.
1902-1903	81,892.25	262	28	10.68	
1903-1904	137,942.45	280	42	15.00	
1904-1905	114,260.45	399	35	8.77	
1905-1906	138,467.95	437	33	7.55	3.43
1906-1907	138,669.75	506	64	12.64	5.73
1907-1908	143,191.90	526	117	22.24	9.88
1908-1909	139,884.10	569	141	24.60	12.13

There are forty fertilizer companies doing business in the state, and more than half of them supplied goods no sample of which was found as much as 3% below guarantee in relative value.

The following statement prepared from summaries in Table II is interesting from the standpoint of a general review of the results for the season:

Number of samples analyzed	569
Percentage equal to guaranty in Phos. Acid, Nitrogen and Potash	44.46
Percentage equal to or above guaranty in relative value	75.40
Percentage 4% or more above guaranty in relative value	48.86
Percentage 6% or more above guaranty in relative value	34.97
Percentage 10% or more above guaranty in relative value	15.64
Percentage 4% or more below guaranty in relative value	10.02
Percentage 6% or more below guaranty in relative value	4.92
Percentage 10% or more below guaranty in relative value	1.93

It is safe to assume that very little fertilizer has been sold which was deficient as much as 6% in relative commercial value. Manufacturers to whom these low analyses were reported usually hold that they make every endeavor to have their goods contain all the plant

food guaranteed. It is difficult to prepare mixtures which are homogeneous at all times, and it should be remembered in this connection that an excess of acid phosphate in a mixture will quickly depress the percentage of nitrogen and potash, especially when these are derived from products carrying high percentages. A deficiency, for example, of 0.25% of nitrogen will deduct \$0.94 from the relative value, and an excess of 0.25% of phosphoric will add only about 30 cents to it.

It appears evident that a few manufacturers are operating on close margins, and as long as this is the case unsatisfactory results cannot be prevented. Many manufacturers find it possible to mix their goods so thoroughly that no deficiencies can be found in the examination of a comparatively large number of samples representing sales throughout the entire season, and more careful mixing, with reasonable margins for variations in raw materials, will undoubtedly practically prevent the frequent appearance in these bulletins of analyses, revealing a lack of care or a lack of control of factory conditions which the best interests of farmers (as well as of the manufacturers themselves) can scarcely permit.

Deficiencies in nitrogen.—It is unfortunate that the inspection this season brings to light more marked deficiencies in nitrogen than heretofore found. This is disappointing to the trade and unfair to the planter, who expects the manufacturer to maintain his guarantee especially on this important and expensive element. The sharp competition in the fertilizer business has doubtless enabled the farmer to buy fertilizers of exceptionally low prices, but the makers of these fertilizers can ill afford to risk the damage to the reputations of their brands which is certain to follow the publication of a whole series of analyses below guaranty in nitrogen.

It is true that the excess in phosphoric acid in very many cases prevents a too great depression in relative commercial values when nitrogen determinations are low, but a compensation of this kind is allowable to only a limited extent. The essential character of a fertilizer ought not to be modified even though the final results give a value equal to the guaranty.

Farmers should support manufacturers who maintain their guaranties without regard to competitive conditions; they may have to charge a little more than those who sell goods slightly under or barely equal to guaranties, but the fertilizers are worth more to the purchasers.

Let it be said that Mississippi brands always redeem the claims made for them at the cost even of somewhat advanced prices if necessary. Let dealers, as well as farmers give greater consideration to

the amounts and value of the several forms of plant food contained in a ton, and pay less attention to the price of a ton until this information has been secured. Let manufacturers see that all goods are properly compounded, and this system of inspection will place within the reach of all interested in this trade accurate information concerning the composition of fertilizers sold in this state.

General averages.—Table III on page 20 has been prepared for the purpose of giving a general view of the guaranties filed for the several classes of fertilizers, and the average composition of the goods sold them. Attention should be directed to the fact that the averages shown for inspectors' samples are not averages in a strict sense, since these results were obtained by making averages from the average analyses in table V. This procedure, however, does not involve a serious loss of accuracy in these cases, and the table is interesting especially when considered in connection with tables I and II immediately preceding it.

Average of guaranties.—Only those guaranties which are represented by analyses in this bulletin are given in table III. Table IV shows the average of all guaranties filed for season 1908-1909 on the several classes of fertilizers sold. Representative samples of all brands registered could not be obtained. Probably very few shipments of some of them were ever made.

Penalties.—Section 2257 of the fertilizer law states that all contracts made for the sale of fertilizers lacking materially any of the valuable elements specified in the certificate (guarantee) shall become void and provides that the whole of such deficient shipments shall be forfeited to the county wherein the same may be.

Section 2258 makes provision for the enforcement of the clause referring to the confiscation of deficient goods.

Since the greater portion of the total business is done usually between January fifteenth and April first, shipments received by dealers are distributed throughout the state very rapidly, and it most often happens that before a report of an analysis of a deficient sample can be placed in the hands of the dealer all of the consignment represented by the samples has been sold, leaving no practicable way of enforcing this special part of the law. This does not always happen, however, and when an occasional error is discovered the deficient fertilizer is returned to the factory if no intentional fraud appears evident. If the circumstances indicate fraudulent intent, or if material deficiencies are frequent, the goods will be attached as provided by law.

In all cases analyses of samples are reported to the owner of the fertilizer from which the sample was drawn. If the analysis is below the guaranteed analysis of the manufacturer, the facts are fully explained in a special letter accompanying the report.

Almost without exception manufacturers indicate a desire to protect their customers from loss growing out of errors at their factory. This is done without discussion as to whether the deficiencies shown by the analysis are or are not "material" within the meaning of the law. In all cases, of course, the farmer is the person damaged, and no recompense is just which does not reach him. The dealer suffers no loss when he sells deficient fertilizer bought by him under guaranty from the manufacturer.

The publication in these bulletins of analyses of samples below guaranty makes it impossible for any manufacturer to build up a business in adulterated fertilizer. Those who have capital invested in these plants are very anxious to see that their guaranties are maintained, and, if they are, the publications of the Department bring their brands into prominence; if they are not, loss of business is certain to follow.

Manufacturers sometimes request that low analyses be omitted from these bulletins on the basis that the sample does not properly represent their goods, and therefore, the publication of an analysis of it would unjustly damage their business. If the fact that the sample is unfair can be established, the analysis should not be published. While the possibilities of errors cannot be excluded, inspectors draw the samples with scrupulous care, and when all records concerning them are clear, the analyses must be published without regard to the information which they may disclose.

(1) Number of samples containing only potash	26
(2) Number of samples containing only nitrogen	1
(3) Number of samples containing only phosphoric acid	174
(4) Number of samples containing potash, nitrogen and phosphoric acid.....	358
(5) Number of samples containing only phosphoric acid and nitrogen	2
(6) Number of samples containing only phosphoric acid and potash	0
(7) Number of samples of ground bone.....	4
(8) Number of samples of bat guano.....	2
(9) Number of samples of castor pomace	2
(10) Number of official (manufacturers)' samples	311

TABLE I.—A Summary of Results in Table V.

NAME AND ADDRESS OF MANUFACTURER.	Number of Samples Analyzed.	Number of Samples equal to or above guarantee in Available Phosphoric Acid, Nitrogen and Potash.	Number of Samples found as much as five per cent. below guarantee in Available Phosphoric Acid.	Number of Samples found as much as eight per cent. below guarantee in Nitrogen.	Number of Samples found as much as eight per cent. below guarantee in Potash.	Number of Samples found as much as three per cent below guarantee in Relative Commercial Value.	Number of Samples found to be equal to or above guarantee in Relative Commercial Value.
ALABAMA CHEMICAL CO., Montgomery, Ala.	4	2	1	1	1	0	4
ARMOUR FERTILIZER WORKS, Atlanta, Ga.	1	0	0	1	1	0	0
BIRMINGHAM FERTILIZER CO., Birmingham, Ala.	12	4	0	4	4	0	9
BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.	7	1	0	2	1	0	5
CANTON OIL MILL CO., Canton, Miss.	7	6	0	0	0	0	7
CAPITAL FERTILIZER & M'F'G. CO., Jackson, Miss.	43	18	0	8	6	2	37
CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. CO., Crystal Springs, Miss.	12	8	0	2	1	2	10
EAGLE COTTON OIL CO., Meridian, Miss.	8	4	0	1	1	0	8
FEDERAL CHEMICAL CO., Louisville, Ky.	4	0	1	4	1	4	0
FLORENCE COTTON OIL CO., Florence, Ala.	4	0	1	2	1	0	2
A. H. GEORGE & CO., Meridian, Miss.	6	2	1	0	1	1	3
GREAT SOUTHERN PHOSPHATE CO., Mt. Pleasant, Tenn.	15	6	0	2	0	3	6
GULFPORT COTTON OIL, FERT. & M'F'G. CO., Gulfport, Miss.	20	11	1	2	6	0	17
HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss.	12	8	0	1	1	0	12
INDEPENDENT OIL & FERT. WORKS, Columbus, Miss.	1	0	0	1	1	0	1
JACKSON FERTILIZER COMPANY, Jackson, Miss.	60	28	2	5	8	6	51
JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.	6	1	2	0	1	3	2
LAUREL OIL & FERTILIZER CO., Laurel, Miss.	20	18	0	0	1	0	19

LOTTERHOS & HUBER Co., Crystal Springs, Miss.	2	1	0	0	0	0	0	0	2
MARBACH & EAGAN, Crystal Springs, Miss.	2	1	0	1	0	0	0	0	2
MERIDIAN FERTILIZER FACTORY, Meridian, Miss.	92	46	7	12	5	11	11	66	66
MISSISSIPPI FERTILIZER Co., Jackson, Miss.	11	6	0	2	0	0	0	9	9
Mr. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.	7	1	0	2	1	2	2	3	3
NEW ORLEANS ACID & FERT. Co., New Orleans, La.	36	5	4	17	13	7	7	21	21
NITRATE AGENCIES Co., New Orleans, La.	1	1	0	0	0	0	0	1	1
NEWTON OIL & M'F'G. Co., Newton, Miss.	8	4	0	1	1	1	1	5	5
PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La.	5	1	0	0	1	0	0	5	5
PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.	8	3	0	2	0	0	0	7	7
READ PHOSPHATE Co., Nashville, Tenn.	6	3	1	2	0	1	1	4	4
REFUGE COTTON OIL Co., Columbus, Miss.	13	6	0	3	3	1	1	10	10
SHUBUTA OIL & M'F'G. Co., Shubuta, Miss.	4	4	0	0	0	0	0	4	4
SOUTHERN OIL & FERT. Co., Meridian, Miss.	12	5	0	4	6	0	0	12	12
STANDARD GUANO & CHEMICAL M'F'G. Co., New Orleans, La.	31	18	2	3	3	3	3	25	25
SWIFT FERTILIZER WORKS, Atlanta, Ga.	3	0	0	2	2	2	1	1	1
TENNESSEE CHEMICAL Co., Nashville, Tenn.	2	1	0	1	0	0	0	1	1
TENNESSEE VALLEY FERT. Co., Florence, Ala.	6	0	1	4	2	4	1	1	1
THREEFOOT BROS. & Co., Meridian, Miss.	4	3	0	0	0	0	0	3	3
TUPELO FERTILIZER FACTORY, Tupelo, Miss.	14	7	1	2	3	2	2	12	12
VIRGINIA CAROLINA CHEMICAL Co., Memphis, Tenn.	56	19	2	17	13	14	14	40	40
WESSON COTTON OIL & FERT. Co., Wesson, Miss.	4	1	0	1	1	1	1	2	2
Total	569	253	27	112	89	69	69	429	429
Percentage		44.46	4.98	30.35	22.94	12.13	12.13	75.40	75.40
Totals for Season 1907-1908	526	275	37	57	32	52	52	409	409
Percentages for Season 1907-1908		52.28	7.37	16.28	8.53	9.88	9.88	77.76	77.76
Totals for Season 1906-1907	506	285	27	47	47	29	29	442	442
Percentages for Season 1906-1907		56.32	5.33	13.35	12.43	5.73	5.73	87.35	87.35
Totals for Season 1905-1906	437	246	16	66	15	15	15	404	404
Percentages for Season 1905-1906		56.29	3.78	19.64	4.36	3.43	3.43	92.45	92.45

TABLE II.—A Further Summary of Results in Table V.

NAME AND ADDRESS OF MANUFACTURER.	Number of Samples Analyzed.	Number equal to or above guarantee in Available Phosphoric Acid, Nitrogen and Potash.	Number equal or above guarantee in Relative Value.	Number as much as four per cent above guarantee in Relative Value.	Number ten per cent or more above guarantee in Relative Value.	Number as much as four per cent below guarantee in Relative Value.	Number as much as six per cent below guarantee in Relative Value.	Number ten per cent or more below guarantee in Relative Value.
ALABAMA CHEMICAL Co., Montgomery, Ala.	4	2	4	3	1	0	0	0
ARMOUR FERTILIZER WORKS, Atlanta, Ga.	1	0	0	0	0	0	0	0
BIRMINGHAM FERTILIZER Co., Birmingham, Ala.	12	4	9	7	3	0	0	0
BROOKHAVEN COTTON OIL & FERT. Co., Brookhaven, Miss.	7	1	5	1	0	0	0	0
CANTON OIL MILL Co., Canton, Miss.	7	6	7	7	6	0	0	0
CAPITAL FERT. & M'f'g. Co., Jackson, Miss.	43	18	37	23	14	9	1	0
CRYSTAL SPRINGS OIL MILL, FERT. & M'f'g. Co., Crystal Sp'gs., Miss.	12	8	10	9	6	2	0	0
EAGLE COTTON OIL Co., Meridian, Miss.	8	4	8	6	3	0	0	0
FEDERAL CHEMICAL Co., Louisville, Ky.	4	0	0	0	0	2	1	1
FLORENCE COTTON OIL Co., Florence, Ala.	4	0	2	2	0	2	1	1
A. H. GEORGE & COMPANY, Meridian, Miss.	6	2	3	0	0	0	1	0
GREAT SOUTHERN PHOSPHATE Co., Mt. Pleasant, Tenn.	15	6	6	4	3	1	1	0
GULFPORT COTTON OIL, FERT. & M'f'g. Co., Gulfport, Miss.	20	11	17	11	10	0	0	0
HAZLEHURST OIL MILL & FERT. Co., Hazlehurst, Miss.	12	8	12	10	8	0	0	0
INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss.	1	0	1	0	0	0	0	0
JACKSON FERTILIZER COMPANY, Jackson, Miss.	60	28	51	32	24	8	4	2
JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.	6	1	2	1	0	3	2	1

LAUREL OIL & FERTILIZER Co., Laurel, Miss.	20	18	19	18	15	7	0	0	0
LOTTERHOS & HUBER Co., Crystal Springs, Miss.	2	1	2	1	1	0	0	0	0
MARBACH & EAGAN, Crystal Springs, Miss.	2	1	2	2	2	2	0	0	0
MERIDIAN FERTILIZER FACTORY, Meridian, Miss.	92	46	66	45	35	15	6	4	1
MISSISSIPPI FERTILIZER Co., Jackson, Miss.	11	6	9	7	3	1	0	0	0
Mt. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.	7	1	3	2	1	0	1	0	0
NEW ORLEANS ACID & FERT. Co., New Orleans, La.	36	5	21	3	1	0	7	5	3
NITRATE AGENCIES Co., New Orleans, La.	1	1	1	0	0	0	0	0	0
NEWTON OIL & M'f'g. Co., Newton, Miss.	8	4	5	3	2	1	1	0	0
PLANTERS FERT. & CHEMICAL Co., New Orleans, La.	5	4	5	3	3	1	0	0	0
PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.	8	3	7	4	1	0	0	0	0
READ PHOSPHATE Co., Nashville, Tenn.	6	3	4	2	0	0	1	1	1
REFUGEE COTTON OIL Co., Columbus, Miss.	13	6	10	7	5	1	1	0	0
SHURTZA OIL & M'f'g. Co., Shubuta, Miss.	4	4	4	3	3	1	0	0	0
SOUTHERN OIL & FERTILIZER Co., Meridian, Miss.	12	5	12	9	8	6	0	0	0
STANDARD GUANO & CHEMICAL M'f'g. Co., New Orleans, La.	31	18	25	15	9	3	3	2	2
SWIFT FERTILIZER WORKS, Atlanta, Ga.	3	0	1	0	0	0	1	1	1
TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.	2	1	1	1	0	0	0	0	0
TENNESSEE VALLEY FERT. Co., Florence, Ala.	6	0	1	0	0	0	4	2	0
THREEFOOT BROS. & Co., Meridian, Miss.	4	3	3	3	3	2	0	0	0
TUPELO FERTILIZER FACTORY, Tupelo, Miss.	14	7	12	8	5	1	2	2	0
VIRGINIA CAROLINA CHEMICAL Co., Memphis, Tenn.	56	19	40	26	11	6	13	4	0
WESSON COTTON OIL & FERTILIZER Co., Wesson, Miss.	4	1	2	0	0	0	1	0	0
Total	569	253	429	278	199	89	57	28	11
Percentage		44.46	75.40	48.86	34.97	15.64	10.02	4.92	1.93

TABLE III.—Averages of Guaranties Compared with Average Composition of the Fertilizers Sold Under Them.—Season 1908-1909.

	Number of Guaranties	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton. Commercial
			Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
Average of guaranties on high grade 16% Acid Phosphates	17		12.94	3.06	16.00	1.53			\$17.29
Average of analyses of inspectors' samples		13.51	11.81	4.20	16.01	.93			17.19
Average of guaranties on high grade Acid Phosphates other than 16%	28		11.43	2.64	14.07	1.45			15.21
Average of analyses of inspectors' samples		13.71	11.21	3.68	14.89	1.27			16.01
Average of guaranties on standard grade Acid Phosphates	9		9.56	2.44	12.00	1.55			12.96
Average of analyses of inspectors' samples		11.71	9.13	3.80	12.93	.91			13.85
Average of guaranties on standard grade Complete fertilizers	73		6.91	2.36	9.27	1.45	1.66	1.64	18.99
Average of analyses of inspectors' samples		12.14	7.06	3.34	10.40	1.12	1.61	1.60	20.02
Average of guaranties on high grade Complete fertilizers	11		7.50	2.59	10.09	2.55	1.65	1.91	20.24
Average of analyses of inspectors' samples		12.51	6.25	4.73	10.98	2.54	1.37	1.87	19.97
Average of guaranties on high grade "Vegetable" fertilizers.....	11		5.23	2.00	7.23	1.18	2.87	3.68	23.47
Average of analyses of inspectors' samples		11.81	6.23	2.79	9.02	1.30	2.92	4.11	26.22

* This table includes only those guaranties represented by samples in this bulletin. See paragraph on "General Averages," page 14 for remarks concerning above average analyses of inspectors' samples.

TABLE IV.—Average of Guaranties Season 1908-1909.

	Number of Guaranties Averaged.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
Average of guaranties on H. G. Acid Phosphate 16%	22	12.87	3.13	16.00	1.50			17.25
Average of guaranties on H. G. Acid Phosphate other than 16%	43	11.30	2.77	14.07	1.53			15.20
Average of guaranties on S. G. Acid Phosphate	23	9.70	2.35	12.05	1.67			13.02
Average of guaranties on H. G. Mixed Fertilizers	30	7.44	2.52	9.96	1.83	1.83	1.83	20.66
Average of guaranties on H. G. Vegetable fertilizers	28	5.18	1.93	7.11	1.38	2.96	4.50	24.61
Average of guaranties on Phosphoric Acid and Potash Compounds	19	7.84	2.63	10.47	2.13		2.32	14.97
Average of guaranties on S. G. Mixed Fertilizer	105	6.88	2.38	9.26	1.53	1.68	1.58	19.00
Average of guaranties on Phosphoric Acid and Nitrogen Compounds	7	7.14	2.62	9.76	1.86	2.11		19.38

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ALABAMA CHEMICAL COMPANY, Montgomery, Ala.,	
10969	S. G. Big Boll Guano	Smith & Easting, Guntown.....
10970	S. G. Big Boll Guano	J. A. Goree, Columbus..... Guarantee.....
10971	S. G. Liberty Bell Blood and Bone	J. N. Shirley, DeSoto..... Guarantee
10972	S. G. Success Mixture.....	Wm. Hinds & Co., Ripley..... Guarantee.....
	ARMOUR FERTILIZER WORKS, Atlanta, Ga.	
10973	S. G. Armour's King Cotton ..	Bourland & Co., Amory..... Guarantee.....
	BIRMINGHAM FERTILIZER CO., Birmingham, Ala.	
10974	Monarch Extra H. G. Acid Phosphate 16%	O'Connell, Rudder Co., Bassfield.....
10975	Monarch Extra H. G. Acid Phosphate 16%	J. A. Mayfield, Amory
		Guarantee.....
10976	Monarch H. G. Acid Phos- phate 14%	Florence Merc. Co., Florence
10977	Monarch H. G. Acid Phos- phate 14%	W. G. Peugh, Aberdeen..... Guarantee
10978	Birmingham H. G. Fertilizer ..	J. A. Lowe & Co., Nettleton.....
10979	Birmingham H. G. Fertilizer ..	J. A. Mayfield, Amory..... Guarantee
10980	Monarch S. G. Blood and Bone Guano	J. S. Eaton & Bro., Taylorsville.....
10981	Monarch S. G. Blood and Bone Guano	E. A. Nunnery, Liberty..... Guarantee.....
10982	Monarch S. G. Meal Mixture ..	J. A. Lowe & Co., Nettleton.....
10983	Monarch S. G. Meal Mixture ..	Holloway & Worthy, Carson.....
10984	Monarch S. G. Meal Mixture ..	T. W. Ford & Co., Eupora.....
10985	Monarch S. G. Meal Mixture ..	O'Connell, Rudder Co., Bassfield..... Average..... Guarantee.....
	BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.	
10986	H. G. Acid Phosphate	Brookhaven Cotton Oil & Fert. Co., Brookhaven
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10969	14.62	7.98	3.69	11.67	.33	.68	2.28	\$18.81
10970	11.98	6.43	2.90	9.33	.66	1.03	4.02	19.39
		7.00	3.00	10.00	2.00	.82	3.00	18.23
10971	15.10	7.62	3.85	11.47	.59	1.66	2.64	22.64
		5.00	3.00	8.00	2.00	1.65	2.00	17.79
10972	12.20	7.79	2.35	10.14	.69	1.77	1.58	20.39
		6.50	3.00	9.50	2.00	1.65	1.50	19.01
10973	9.82	3.80	4.93	8.73	5.90	1.44	1.77	17.42
		6.00	2.00	8.00	1.00	1.65	2.00	17.89
10974	12.29	13.56	4.42	17.98	.60			19.34
10975	14.62	13.92	3.18	17.10	.35			18.49
		14.00	2.00	16.00	2.00			17.40
10976	11.50	8.79	6.30	15.09	1.01			15.97
10977	14.42	11.14	3.73	14.87	1.66			15.98
		12.00	2.00	14.00	2.00			15.20
10978	14.32	7.69	2.74	10.43	1.07	1.59	1.31	19.71
10979	14.74	7.60	3.27	10.87	1.79	1.32	1.84	19.78
		8.00	2.00	10.00	2.00	1.65	2.00	20.29
10980	12.12	6.26	6.07	12.33	.72	1.56	2.29	22.67
10981	12.47	8.55	3.82	12.37	.65	1.32	1.54	21.18
		7.50	2.00	9.50	2.00	1.65	1.50	19.11
10982	14.53	7.60	2.77	10.37	1.00	1.53	1.52	19.65
10983	11.81	7.84	3.50	11.34	.65	1.57	1.23	20.56
10984	13.12	7.05	3.61	10.66	1.87	1.34	1.50	19.18
10985	12.37	7.69	2.79	10.48	.49	1.41	1.32	19.10
	12.96	7.54	3.17	10.71	1.00	1.46	1.39	19.62
		7.50	2.00	9.50	2.00	1.65	1.50	19.11
10986	12.68	10.26	5.00	15.26	.91			16.29
		12.00	2.00	14.00	2.00			15.20

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10987	Brookhaven S. G. Blood & Bone	S. S. Dale & Sons, Prentiss..... Guarantee.....
10988	Brookhaven H. G. Truck Grower	Brookhaven Cotton Oil & Fert. Co., Brookhaven
10989	S. G. Cotton Tail.....	Louis Cohn & Bro., Brookhaven
10990	S. G. Cotton Tail.....	A. C. Seavey & Sons, Brookhaven
10991	S. G. New South	J. F. Armstrong, Sontag.....
10992	S. G. New South	W. J. Carter, Bassfield..... Guarantee.....
CANTON OIL MILL COMPANY, Canton, Miss.		
9858	H. G. Acid Phosphate	Canton Oil Mill Co., Canton.....
10237	H. G. Acid Phosphate	G. B. Ramsey, Durant.....
10993	H. G. Acid Phosphate	W. H. Coulter, Canton..... Average
9859	S. G. Paragon	Canton Oil Mill Co., Canton.....
10044	S. G. Paragon	W. S. Gordons, Pickens.....
10238	S. G. Paragon	Ellis Rogers, West.....
10994	S. G. Paragon	Oxford Supply Co., Oxford..... Average
CAPITAL FERTILIZER & M'F'G. COMPANY, Jackson, Miss.		Guarantee.....
10116	Extra H. G. Acid Phosphate 16%.....	Gallaspy Bros. & Co., Union.....
10239	Extra H. G. Acid Phosphate 16%.....	Mutual Merc. Co., Utica.....
10995	Extra H. G. Acid Phosphate 16%.....	Canton Gin Co., Canton.....
10996	Extra H. G. Acid Phosphate 16%.....	Loper Merc. Co., Lake
10997	Extra H. G. Acid Phosphate 16%.....	Centreville Merc. Co., Centreville
9884	H. G. Acid Phosphate	Average
10240	H. G. Acid Phosphate	Guarantee.....
10881	H. G. Acid Phosphate	Gallaspy Bros. & Co., Union
10998	H. G. Acid Phosphate	J. B. Mitchell, Ackerman.....
10999	H. G. Acid Phosphate	Ginn, McDonald Co., Tylertown
		W. B. Armstrong, Vaiden.....
		Mills, Guy Co., McComb
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10987	11.66	5.26 <i>6.25</i>	4.51 <i>3.00</i>	9.77 <i>9.25</i>	1.45 <i>1.00</i>	1.52 <i>1.65</i>	1.97 <i>1.75</i>	\$19.24 <i>19.00</i>
10988	8.28	3.52 <i>5.00</i>	2.85 <i>1.00</i>	6.37 <i>6.00</i>	.32 <i>1.00</i>	3.04 <i>3.00</i>	3.62 <i>4.00</i>	22.92 <i>22.95</i>
10989	10.61	8.38	3.25	11.63	1.24	1.79	.55	20.98
10990	11.02	7.73 <i>8.00</i>	3.27 <i>2.00</i>	11.00 <i>10.00</i>	.93 <i>1.00</i>	1.97 <i>2.10</i>	.66 <i>.55</i>	21.02 <i>20.31</i>
10991	12.22	5.77	3.31	9.08	1.04	1.62	2.28	19.26
10992	12.34	5.49 <i>6.00</i>	3.24 <i>3.00</i>	8.73 <i>9.00</i>	1.41 <i>1.00</i>	1.58 <i>1.70</i>	2.41 <i>2.00</i>	18.85 <i>19.18</i>
9858	10.85	12.31	4.94	17.25	.64			18.48
10237	11.14	12.91	5.50	18.41	.97			19.70
10993	6.37	13.42	5.40	18.82	.92			20.16
	9.45	12.88	5.28	18.16	.84			19.45
		<i>12.00</i>	<i>4.00</i>	<i>16.00</i>	<i>1.00</i>			<i>17.20</i>
9859	8.66	8.60	4.08	12.68	.50	1.99	.65	23.02
10044	8.60	8.38	4.50	12.88	.41	2.01	.55	23.18
10238	7.55	8.58	3.83	12.41	.52	2.14	.70	23.34
10994	11.85	8.60	3.50	12.10	.35	2.08	.60	22.66
	9.17	8.54	3.98	12.52	.45	2.06	.62	23.06
		<i>6.50</i>	<i>3.50</i>	<i>10.00</i>	<i>1.05</i>	<i>2.00</i>	<i>.50</i>	<i>19.73</i>
10116	14.51	10.50	5.26	15.76	1.44			16.81
10239	13.89	11.97	4.12	16.09	1.29			17.29
10995	11.82	11.46	5.51	16.97	.75			18.12
10996	12.04	12.88	3.52	16.40	.33			17.69
10997	12.85	9.89	6.42	16.31	.96			17.30
	13.02	11.34	4.97	16.31	.95			17.44
		<i>12.00</i>	<i>4.00</i>	<i>16.00</i>	<i>1.00</i>			<i>17.20</i>
9884	11.86	8.58	5.05	13.63	1.05			14.49
10240	12.99	9.59	5.40	14.99	1.09			15.95
10881	12.58	8.61	5.99	14.60	.82			15.46
10998	12.30	10.80	4.82	15.62	.40			16.70
10999	12.84	11.67	3.75	15.42	.96			16.59
	12.51	9.85	5.00	14.85	.86			15.84
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>1.00</i>			<i>15.00</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10117	S. G. Acid Phosphate	Florence Merc. Co., Florence.....
10241	S. G. Acid Phosphate	D'Lo Merc. Co., D'Lo.....
11000	S. G. Acid Phosphate	Cox Merc. Co., Braxton.....
		Average
		Guarantee.....
11001	H. G. Bone Meal	J. W. Grantham & Co., Terry.....
11002	H. G. Bone Meal	W. L. Robinson Co., Liberty.....
		Guarantee.....
10242	S. G. Capital Blood, Bone & Potash.....	Hyman Merc. Co., Summit.....
11003	S. G. Capital Blood, Bone & Potash.....	Dunn & Lee, Hamburg.....
		Guarantee.....
11004	S. G. Capital Early Producer	D. C. Coney, Bogue Chitto.....
11005	S. G. Capital Early Producer	D. C. Griffith & Co., Silver Creek.....
		Guarantee
10243	S. G. Cotton Elevator.....	J. T. Kent & Co., Kilmichael.....
11006	S. G. Cotton Elevator.....	R. C. Cooper, Morton.....
11007	S. G. Cotton Elevator.....	R. C. Cooper, Morton.....
		Average
		Guarantee
9939	H. G. Muriate of Potash	Capital Fert. & Mfg. Co., Jackson.....
		Guarantee
9885	S. G. Nonpariel	Gallaspy Bros. & Co., Union.....
9938	S. G. Nonpariel	Capital Fert. & Mfg. Co., Jackson.....
9969	S. G. Nonpariel	J. D. Ray, Kosciusko.....
10118	S. G. Nonpariel	W. C. Ellis & Co., Magee.....
10244	S. G. Nonpariel	Hyman Merc. Co., Summit.....
10245	S. G. Nonpariel	Cox Merc. Co., Braxton.....
11008	S. G. Nonpariel	S. Cohn & Sons, Magnolia.....
11009	S. G. Nonpariel	D. C. Griffith & Co., Silver Creek.....
11010	S. G. Nonpariel	The Rankin Co., Columbia.....
11011	S. G. Nonpariel	Risher & Ruffin, Taylorsville.....
11012	S. G. Nonpariel	Conner Lumber Co., Seminary.....
11013	S. G. Nonpariel	W. L. Robinson Co., Liberty.....
11014	S. G. Nonpariel	J. W. Grantham & Co., Terry.....
11015	S. G. Nonpariel	Florence Merc. Co., Florence.....
11016	S. G. Nonpariel	Loper Merc. Co., Lake.....
		Average
		Guarantee
10119	S. G. Red Star Brand.....	Gallaspy Bros. & Co., Union.....
10246	S. G. Red Star Brand.....	Canton Gin Co., Canton.....
		Guarantee
9940	H. G. Sulphate of Potash	Capital Fert. & Mfg. Co., Jackson.....
		Guarantee
10247	S. G. German Kainit	Capital Fert. & Mfg. Co., Jackson.....
11017	S. G. German Kainit	W. L. Robinson Co., Liberty.....
		Guarantee

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10117	12.95	8.47	4.33	12.80	1.10			\$13.65
10241	11.55	7.74	4.70	12.44	.90			13.21
11000	10.49	8.71	3.88	12.59	.33			13.46
	11.66	8.31	4.30	12.61	.78			13.44
		10.00	2.00	12.00	1.00			13.00
11001	3.37				23.38	2.44		20.84
11002	3.66				26.26	2.20		21.38
					25.00	2.50		21.88
10242	10.90	7.06	2.53	9.59	.23	1.59	2.00	19.52
11003	12.41	7.57	3.17	10.74	.10	1.09	1.68	18.59
		6.50	2.50	9.00	1.00	1.65	2.00	19.04
11004	10.88	8.25	2.63	10.88	.70	1.91	.62	20.67
11005	10.81	6.36	4.00	10.36	.99	2.42	.71	21.92
		6.50	3.00	9.50	1.00	2.00	.50	19.18
10243	11.22	9.66	2.17	11.83	.70	1.37	1.56	20.91
11006	13.16	6.04	3.65	9.69	.97	1.59	2.06	19.59
11007	11.80	7.89	1.49	9.38	.24	1.70	2.35	20.18
	12.06	7.86	2.44	10.30	.61	1.55	1.99	20.22
		6.50	2.50	9.00	1.00	1.65	2.00	19.04
9939	1.26						53.70	61.76
							48.00	55.20
9885	13.87	6.17	3.71	9.88	.95	1.56	1.64	19.22
9938	12.82	6.01	4.03	10.04	.80	1.69	1.94	20.21
9969	12.74	5.81	4.01	9.82	.77	1.56	2.05	19.59
10118	14.50	6.52	3.53	10.05	.90	1.58	1.93	19.85
10244	13.02	8.83	1.30	10.13	.69	1.59	2.03	20.32
10245	12.80	8.12	2.20	10.32	1.04	1.52	1.74	19.87
11008	13.30	6.55	3.80	10.35	.81	1.45	2.01	19.79
11009	12.15	7.54	2.55	10.09	1.04	1.59	2.19	20.33
11010	11.37	7.66	2.98	10.64	.77	1.81	2.02	21.58
11011	11.76	6.50	3.13	9.63	.69	1.67	2.23	20.07
11012	12.72	6.42	3.58	10.00	.65	1.55	2.05	19.81
11013	11.93	7.45	2.84	10.29	.69	1.62	2.02	20.46
11014	12.52	6.22	4.19	10.41	.64	1.49	1.75	19.67
11015	12.86	6.23	3.80	10.03	.65	1.45	1.74	19.09
11016	10.47	7.10	1.72	8.82	.23	1.91	2.75	20.74
	12.59	6.88	3.16	10.04	.75	1.60	2.01	20.04
		6.50	2.50	9.00	1.00	1.65	2.00	19.04
10119	11.93	6.33	3.92	10.25	.87	1.53	1.93	19.87
10246	9.38	6.23	4.07	10.30	.78	1.50	2.25	20.17
		6.50	2.50	9.00	1.00	1.65	2.00	19.04
9940	.78						50.80	58.42

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
CRYSTAL SPRINGS OIL MILL, FERT. & MFG. COMPANY, Crystal Springs, Miss.		
10045	H. G. Acid Phosphate	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs.....
11018	H. G. Acid Phosphate	Lotterhos & Huber Co., Crystal Sp'gs Guarantee.....
10046	S. G. Crystal Springs	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs
11019	S. G. Crystal Springs	Alford & Miller, Gallman.....
9942	H. G. Crystal Veg. Grower	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs.....
11020	H. G. Crystal Veg. Grower	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs.....
9941	S. G. L. & H.'s Cotton Fert. ..	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs.....
10234	S. G. L. & H.'s Cotton Fert. ..	Lotterhos & Huber Co., Crystal Sp'gs. Guarantee.....
10047	H. G. L. & H.'s Veg. Grower ..	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs.....
10235	H. G. L. & H.'s Veg. Grower ..	Lotterhos & Huber Co., Crystal Sp'gs. Guarantee.....
10048	S. G. German Kainit	Crystal Springs Oil Mill, Fert & Mfg. Co., Crystal Springs.....
11021	S. G. German Kainit	Lotterhos & Huber Co., Crystal Sp'gs. Guarantee.....
EAGLE COTTON OIL COMPANY, Meridian, Miss.		
9860	H. G. Acid Phosphate	Eagle Cotton Oil Co., Meridian.....
11022	H. G. Acid Phosphate	C. T. Bonney, Enterprise.....
11023	H. G. Acid Phosphate	W. H. Joyner, Forest.....
		Average
		Guarantee
10049	S. G. Farm Mixture	Forest Gin & Mfg. Co., Forest.....
10248	S. G. Farm Mixture	Ruffin Merc. Co., Ellisville.....
11024	S. G. Farm Mixture	W. H. Gallaspy's Sons Co., Hickory....
11025	S. G. Farm Mixture	R. W. Fagan & Co., Waynesboro.....
		Average
		Guarantee
10050	S. G. German Kainit	Eagle Cotton Oil Co., Meridian.....
		Guarantee
FEDERAL CHEMICAL COMPANY, Louisville, Ky.		
10908	S. G. Daybreak Red Rooster ..	J. A. Mayfield, Amory.....
11026	S. G. Daybreak Red Rooster ..	East & Wingo & Co., Toccopola.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10045	12.75	13.18	3.20	16.38	1.71			\$17.70
11018	14.25	13.46	2.82	16.28	.91			17.63
		10.00	5.00	15.00	1.00			16.00
10046	12.14	7.20	2.32	9.52	1.19	1.77	2.68	20.91
11019	10.99	6.54	2.31	8.85	.63	2.08	3.12	21.78
		6.50	2.50	9.00	1.00	1.70	1.90	19.11
9942	12.13	4.68	2.65	7.33	.78	3.07	3.61	24.20
11020	11.11	4.36	2.26	6.62	.69	2.36	4.08	21.26
		4.00	1.50	5.50	.25	3.00	4.00	22.30
9941	13.95	6.49	2.15	8.64	1.42	2.01	2.07	20.07
10234	10.99	7.71	1.93	9.64	.75	1.91	2.56	21.48
		5.50	2.50	8.00	.75	1.70	2.00	18.03
10047	11.13	4.93	2.12	7.05	.77	2.31	3.89	21.38
10235	9.94	5.46	1.91	7.37	1.01	3.17	4.18	25.35
		4.00	1.50	5.50	.25	3.00	4.00	22.30
10048	3.30						12.20	14.03
11021	8.51						12.92	14.86
							12.00	13.80
9860	12.96	12.92	2.05	14.97	.38			16.26
11022	12.17	10.73	4.14	14.87	.37			15.94
11023	15.06	11.03	3.26	14.29	1.48			15.39
	13.39	11.56	3.15	14.71	.74			15.86
		10.00	4.00	14.00	.50			15.00
10049	13.33	7.11	2.05	9.16	.28	1.32	2.47	18.58
10248	11.97	7.30	2.22	9.52	.63	1.54	2.04	19.32
11024	14.23	7.10	2.57	9.67	.26	1.58	1.83	19.38
11025	13.14	6.96	2.62	9.58	.68	1.54	2.44	19.82
	13.17	7.12	2.36	9.48	.46	1.50	2.19	19.28
		6.00	2.00	8.00	.50	1.65	2.00	17.89
10050	5.38						12.68	14.58
							12.00	13.80
10908	9.11	5.32	4.18	9.50	1.07	1.24	1.52	17.38
11026	9.77	5.33	4.53	9.86	1.06	1.44	1.87	18.93

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11027	S. G. Daybreak Red Rooster . .	Phillips, Reinhart, Taylor Co., Booneville
11028	S. G. Daybreak Red Rooster . .	J. A. Goree, Columbus.....
		Average
		Guarantee
	FLORENCE COTTON OIL CO.,	
	Florence, Ala.	
11029	H. G. Liberty Dissolved Bone	Farmers Union Wse. Co., Philadelphia
11030	H. G. Liberty Dissolved Bone	Farmers Union No. 1728, Stallo.....
		Guarantee.....
11031	S. G. Liberty Cottonseed	
	Meal and Bone	E. W. Cockran, Guntown.....
11032	S. G. Liberty Cottonseed	
	Meal and Bone	Farmers Union Wse. Co., Philadelphia
		Guarantee.....
	A. H. GEORGE & COMPANY,	
	Meridian, Miss.	
10249	George's H. G. Acid Phos.....	B. R. Fail, Bay Springs.....
11033	George's H. G. Acid Phos.....	Lampton Rawls Co., Mt. Olive.....
		Guarantee.....
9970	George's S. G. Cotton King	Meyer Bros., Meridian
10250	George's S. G. Cotton King	Lampton Merc. Co., Magnolia.....
11034	George's S. G. Cotton King	J. L. Moyse & Bro., Summit.....
11035	George's S. G. Cotton King	S. F. Thigpen, Bay Springs.....
		Average
		Guarantee.....
	GREAT SOUTHERN PHOSPHATE	
	COMPANY,	
	Mt. Pleasant, Tenn.	
10197	Great Southern H. G. Special	
	Acid Phosphate	Steens Bell Warehouse Co., Steens.....
10251	Great Southern H. G. Special	
	Acid Phosphate	Farmers Union Warehouse Co., Amory
11036	Great Southern H. G. Special	
	Acid Phosphate	Farmers Union, Shivers.....
11037	Great Southern H. G. Special	
	Acid Phosphate	Farmers Union Warehouse Co., Carson
		Average
		Guarantee.....
9943	H. G. Best by Test	H. C. Bossett, Forest
10198	H. G. Best by Test	Steens Bell Warehouse Co., Steens.....
10252	H. G. Best by Test	Farmers Union Wse. Co., Pelahatchie
11038	H. G. Best by Test	Farmers Union, Iuka
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11027	8.27	6.15	5.08	11.23	1.25	1.16	1.34	\$18.86
11028	7.24	6.04	4.79	10.83	1.28	1.06	1.79	18.55
	8.59	5.71	4.65	10.36	1.16	1.23	1.63	18.43
		6.67	3.33	10.00	1.00	1.65	1.50	19.58
11029	15.13	8.92	4.60	13.52	1.70			14.41
11030	14.68	8.30	4.38	12.68	4.68			13.51
		12.00	2.00	14.00	2.00			15.20
11031	16.72	7.89	2.74	10.63	1.89	1.23	1.75	19.11
11032	16.35	8.06	2.12	10.18	1.75	1.40	2.25	19.84
		6.00	2.00	8.00	2.00	1.65	2.00	17.89
10249	12.68	10.21	4.22	14.43	.74			15.45
11033	13.70	8.39	6.28	14.67	1.04			15.51
		12.00	2.00	14.00	2.00			15.20
9970	12.42	6.69	2.84	9.53	.95	1.43	2.05	18.87
10250	11.07	7.45	2.64	10.09	.82	1.46	2.00	19.62
11034	12.43	7.56	2.93	10.49	.58	1.55	1.73	20.10
11035	12.19	6.56	2.73	9.29	.79	1.68	2.13	19.62
	12.03	7.07	2.78	9.85	.78	1.53	1.98	19.55
		8.00	2.00	10.00	2.00	1.50	2.00	19.73
10197	15.50	14.01	1.79	15.80	1.18			17.20
10251	13.78	13.16	2.80	15.96	1.13			17.28
11036	13.80	11.53	4.15	15.68	1.25			16.83
11037	12.92	12.29	3.26	15.55	1.78			16.78
	14.00	12.75	3.00	15.75	1.33			17.02
		14.00	2.00	16.00	2.00			17.40
9943	12.53	5.85	4.70	10.55	5.07	1.05	2.02	18.45
10198	13.14	6.18	4.49	10.67	3.67	1.39	1.91	19.76
10252	10.66	6.60	3.61	10.21	4.31	1.68	2.10	20.61
11038	11.83	5.07	5.34	10.41	4.77	1.54	2.00	20.03
	12.04	5.93	4.53	10.46	4.46	1.42	2.00	19.71
		7.00	3.00	10.00	5.00	1.65	2.00	20.19

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10199	H. G. Gen. Lee Cotton Grower	Steens Bell Warehouse Co., Steens.....
11039	H. G. Gen. Lee Cotton Grower	Farmers Union No. 1591, Waynesboro Guarantee.....
11040	O. G. The Planters Champion..	Farmers Union Wse. Co., Pelahatchie
11041	O. G. The Planters Champion..	Farmers Union Warehouse Co., Morton
11042	O. G. The Planters Champion..	Farmers Union, Bassfield.....
		Average
		Guarantee.....
10253	S. G. German Kainit	Farmers Union Wse. Co., Pelahatchie
11043	S. G. German Kainit	Union Warehouse Co., Aberdeen
		Guarantee.....
	GULFPORT COTTON OIL, FERTILIZER & M'F'G. COMPANY, Gulfport, Miss.	
10254	Primo H. G. Acid Phos. 16%..	Gallaspy Bros. & Co., Union.....
11044	Primo H. G. Acid Phos. 16%..	Yarborough & Everett, Hickory.....
11045	Primo H. G. Acid Phos. 16%..	W. A. Holliday, Mt. Olive.....
		Average
		Guarantee.....
10051	Primo H. G. Acid Phos. 14%..	T. S. Turner, Canton.....
10255	Primo H. G. Acid Phos. 14%..	J. M. Boyd, Louin.....
		Guarantee.....
10256	Primo S. G. Acid Phosphate ..	J. W. Williams, Braxton.....
11046	Primo S. G. Acid Phosphate ..	R. M. McCrary, Pachuta.....
		Guarantee.....
11047	Primo H. G. Blood & Bone	M. Oates, Bay Springs.....
11048	Primo H. G. Blood & Bone	R. A. Welborne, Stringer.....
		Guarantee.....
10052	Primo S. G. C. S. Meal Com- pound	T. S. Turner, Canton.....
10120	Primo S. G. C. S. Meal Com- pound	Berry & Murray, Star.....
10257	Primo S. G. C. S. Meal Com- pound	J. W. Williams, Braxton.....
11049	Primo S. G. C. S. Meal Com- pound	H. T. Fortner, Columbia.....
11050	Primo S. G. C. S. Meal Com- pound	D. E. Lampton & Co., Tylertown.....
		Average
		Guarantee.....
9861	Primo S. G. R. B. Superphos...	Gulfport Cotton Oil, Fert & Mfg. Co., Gulfport
10121	Primo S. G. R. B. Superphos...	Berry & Murray, Star.....
10258	Primo S. G. R. B. Superphos...	M. M. Moody, Long Beach.....
11051	Primo S. G. R. B. Superphos...	W. L. Martin, Florence.....
		Average
		Guarantee.....
10259	Primo S. G. German Kainit	T. S. Turner, Canton.....
11052	Primo S. G. German Kainit	J. S. Eaton & Bro., Taylorsville.....
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10199	12.26	6.77	3.79	10.56	3.85	1.58	1.19	\$19.59
11039	13.30	7.70 <i>8.00</i>	5.47 <i>3.00</i>	13.17 <i>11.00</i>	.88 <i>5.00</i>	1.67 <i>1.65</i>	1.32 <i>1.00</i>	23.04 <i>20.24</i>
11040	11.97	6.01	4.43	10.44	4.98	1.01	1.28	17.34
11041	11.88	4.46	5.70	10.16	5.76	.97	1.16	16.59
11042	12.82	5.09	5.82	10.91	4.61	.97	1.54	17.92
	12.22	5.19 <i>7.00</i>	5.31 <i>3.00</i>	10.50 <i>10.00</i>	5.11 <i>5.00</i>	.98 <i>.82</i>	1.33 <i>1.00</i>	17.28 <i>15.93</i>
10253	3.93						12.32	14.17
11043	6.01						11.83 <i>12.00</i>	13.60 <i>13.80</i>
10254	14.00	13.32	3.21	16.53	1.16			17.86
11044	15.22	10.57	5.53	16.10	.12			17.16
11045	15.80	9.17	7.02	16.19	.08			17.11
	15.01	11.02 <i>14.00</i>	5.25 <i>2.00</i>	16.27 <i>16.00</i>	.45 <i>1.00</i>			17.37 <i>17.40</i>
10051	15.33	12.13	2.16	14.29	2.12			15.50
10255	13.37	12.05 <i>12.00</i>	3.38 <i>2.00</i>	15.43 <i>14.00</i>	1.29 <i>1.00</i>			16.64 <i>15.20</i>
10256	15.97	10.68	2.97	13.65	1.39			14.72
11046	16.80	9.62 <i>10.00</i>	3.85 <i>2.00</i>	13.47 <i>12.00</i>	1.10 <i>1.00</i>			14.43 <i>13.00</i>
11047	13.13	7.93	3.93	11.86	.20	2.12	1.36	23.35
11048	11.41	7.42 <i>8.00</i>	3.10 <i>2.00</i>	10.52 <i>10.00</i>	2.37 <i>1.00</i>	2.29 <i>1.65</i>	1.27 <i>2.00</i>	22.36 <i>20.29</i>
10052	14.91	7.42	2.13	9.55	1.85	1.49	1.93	19.05
10120	13.77	6.31	2.87	9.18	.64	1.52	2.11	18.86
10257	12.62	5.87	3.28	9.15	.67	1.77	2.15	19.76
11049	12.09	4.64	3.51	8.15	.46	1.94	2.26	19.30
11050	13.38	7.18	2.40	9.58	1.55	1.65	2.23	20.01
	13.35	6.28 <i>7.00</i>	2.84 <i>2.00</i>	9.12 <i>9.00</i>	1.03 <i>1.00</i>	1.67 <i>1.65</i>	2.14 <i>2.00</i>	19.40 <i>19.09</i>
9861	13.55	8.10	2.83	10.93	1.38	1.57	1.47	20.41
10121	14.22	8.58	3.14	11.72	.22	1.53	1.74	21.49
10258	11.19	7.65	3.06	10.71	.96	1.90	1.63	21.55
11051	12.35	6.27	3.73	10.00	1.37	1.89	1.42	20.35
	12.83	7.65 <i>7.00</i>	3.19 <i>2.00</i>	10.84 <i>9.00</i>	.98 <i>1.00</i>	1.72 <i>1.65</i>	1.57 <i>2.00</i>	20.95 <i>19.09</i>
10259	3.46						12.73	14.64
11052	4.71						12.18 <i>12.00</i>	14.01 <i>13.80</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
HAZLEHURST OIL MILL & FERTILIZER COMPANY, Hazlehurst, Miss.		
9862	H. G. Acid Phosphate	H'hurst Oil Mill & Fert. Co., Hazlehurst
10053	H. G. Acid Phosphate	Ginn & McDonald Co., Tylertown.....
10882	H. G. Acid Phosphate	Ginn & McDonald Co., Tylertown.....
11053	H. G. Acid Phosphate	Donald Bros., Magee.....
		Average
		Guarantee.....
9944	S. G. Imperial Fertilizer	Hazlehurst Oil Mill & Fert. Co., H'hurst
10054	S. G. Imperial Fertilizer	J. R. Gallaspy, Crystal Springs.....
10883	S. G. Imperial Fertilizer	Ginn & McDonald Co., Tylertown.....
11054	S. G. Imperial Fertilizer	Osyka Merc. Co., Osyka.....
11055	S. G. Imperial Fertilizer	Simpson Merc. Co., Terry.....
		Average
		Guarantee.....
9863	H. G. Imperial Veg. Grower ..	Hazlehurst Oil Mill & Fert. Co., H'hurst
		Guarantee.....
9864	S. G. German Kainit	Hazlehurst Oil Mill & Fert. Co., H'hurst
11056	S. G. German Kainit	Hazlehurst Oil Mill & Fert. Co., H'hurst
		Guarantee.....
INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss.		
10260	H. G. Independent All Lint Fertilizer.....	A. J. Saunders, Steens.....
		Guarantee.....
JACKSON FERTILIZER CO., Jackson, Miss.		
9865	H. G. Acid Phosphate 16%.....	Lampton Merc. Co., Magnolia.....
10055	H. G. Acid Phosphate 16%.....	Lampton Rawls Co., Mt. Olive.....
10181	H. G. Acid Phosphate 16%.....	Risher & Ruffin, Taylorsville.....
11057	H. G. Acid Phosphate 16%.....	Wilson & Boyd, Kilmichael.....
11058	H. G. Acid Phosphate 16%.....	Lotterhos & Huber Co., Crystal Springs
11059	H. G. Acid Phosphate 16%.....	Liberty Merc. Co., Liberty.....
11060	H. G. Acid Phosphate 16%.....	W. A. Dickson, Pinola.....
11061	H. G. Acid Phosphate 16%.....	Harrell & Coon, Woodville.....
		Average
		Guarantee.....
10122	H. G. Acid Phosphate 14%.....	Centreville Merc. Co., Centreville.....
10261	H. G. Acid Phosphate 14%.....	Taylor & Cook, Ethel.....
11062	H. G. Acid Phosphate 14%.....	The Fair Co., Louisville.....
11063	H. G. Acid Phosphate 14%.....	Barney Johns Co., Gloster.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9862	16.03	12.68	2.63	15.31	1.16			\$16.58
10053	14.03	11.74	2.52	14.26	.56			15.43
10882	14.95	11.10	3.85	14.95	1.24			16.06
11053	15.32	11.87	3.26	15.13	1.33			16.32
	15.08	11.85	3.06	14.91	1.07			16.09
		12.00	2.00	14.00	1.00			15.20
9944	11.86	7.38	2.89	10.27	1.30	1.40	1.92	19.49
10054	11.29	7.88	2.13	10.01	.51	1.53	2.16	20.02
10883	12.29	6.93	2.95	9.88	1.07	1.92	2.06	21.13
11054	10.89	7.32	3.17	10.49	.72	1.57	1.93	20.38
11055	12.84	7.70	2.42	10.12	.42	1.69	1.90	20.42
	11.83	7.44	2.71	10.15	1.00	1.62	1.99	20.29
		7.00	2.00	9.00	1.00	1.65	1.75	18.80
9863	9.54	4.34	2.64	6.98	.46	3.67	2.49	24.74
		4.50	2.50	7.00	1.00	2.50	2.50	20.40
9864	.86						13.08	15.04
11056	2.82						12.68	14.58
							12.00	13.80
10260	13.00	9.59	2.18	11.77	.63	1.44	1.42	20.94
		8.00	2.00	10.00	1.00	1.65	2.00	20.29
9865	14.27	12.63	2.86	15.49	1.10			16.75
10055	14.16	12.86	2.57	15.43	1.53			16.72
10181	16.28	13.01	2.72	15.73	1.32			17.03
11057	11.84	12.08	4.16	16.24	1.64			17.45
11058	15.64	12.19	3.61	15.80	1.48			17.02
11059	13.45	12.17	4.03	16.20	1.89			17.42
11060	13.80	12.29	2.52	14.81	2.54			16.04
11061	15.16	12.64	2.14	14.78	1.98			16.04
	14.32	12.48	3.08	15.56	1.68			16.81
		13.00	3.00	16.00	1.00			17.30
10122	14.77	11.74	2.75	14.49	1.99			15.66
10261	16.01	12.45	2.88	15.33	1.01			16.58
11062	16.21	12.37	2.93	15.30	1.04			16.54
11063	15.05	12.31	2.86	15.17	1.25			16.40
	15.51	12.22	2.85	15.07	1.32			16.27
		12.00	2.00	14.00	1.00			15.20

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10056	S. G. Black Hawk Acid Phos.	T. B. Gaddis, Morton.....
10123	S. G. Black Hawk Acid Phos.	R. F. Everett, Braxton.....
11064	S. G. Black Hawk Acid Phos.	J. E. Singletary & Bro. Florence...
11065	S. G. Black Hawk Acid Phos.	Walker Durr Co., Pinola.....
		Average
		Guarantee.....
10262	H. G. Bone Meal	Lampton Bros. & Co., Tylertown.....
11066	H. G. Bone Meal	The Lampton Co., Columbia.....
		Guarantee
10263	S. G. Chicago R. B. Super-phosphate	Centreville Merc. Co., Centreville.....
11067	S. G. Chicago R. B. Super-phosphate	J. W. Grantham & Co., Terry.....
11068	S. G. Chicago R. B. Super-phosphate	Barr & Lewis, Bogue Chitto
		Average
		Guarantee.....
10124	S. G. Early Dixie	Risher & Ruffin, Taylorsville.....
11069	S. G. Early Dixie	C. W. Taylor, Pelahatchie.....
11070	S. G. Early Dixie	S. Hirsch, Fayette.....
		Average
		Guarantee.....
10057	H. G. Fruit & Veg. Grower	Lotterhos & Huber Co., Crystal Springs
11071	H. G. Fruit & Veg. Grower	The Lampton Co., Columbia.....
		Guarantee.....
9945	H. G. Huber's Veribest	Lotterhos & Huber Co., Crystal Sp'gs
10236	H. G. Huber's Veribest	Lotterhos & Huber Co., Crystal Springs
11072	H. G. Huber's Veribest	Lotterhos & Huber Co., Crystal Springs
11073	H. G. Huber's Veribest	Lotterhos & Huber Co., Crystal Springs
		Average
		Guarantee.....
10264	S. G. Lampton's R. B. Super-phosphate	The Lampton Co., Columbia.....
11074	S. G. Lampton's R. B. Super-phosphate	Stringer Merc. Co., Stringer.....
11075	S. G. Lampton's R. B. Super-phosphate	Bolton Merc. Co., Bogue Chitto.....
		Average
		Guarantee.....
11076	S. G. New Era Acid & Meal Mixture	C. Atkinson's Sons Co., Summit.....
11077	S. G. New Era Acid & Meal Mixture	R. F. Everett, Braxton.....
		Guarantee.....
9866	S. G. Royal "C" Brand	T. B. Gaddis, Morton.....
9867	S. G. Royal "C" Brand	Story & Co., Forest.....
9886	S. G. Royal "C" Brand	Henderson-Molphus Co., Philadelphia
9946	S. G. Royal "C" Brand	Alford & Miller, Gallman.....
10058	S. G. Royal "C" Brand	Lampton Rawls Co., Mt. Olive.....
10059	S. G. Royal "C" Brand	Lotterhos & Huber Co., Crystal Springs
10125	S. G. Royal "C" Brand	Crawford & Coleman, Noxapater.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10056	14.87	11.31	2.71	14.02	1.69			\$15.15
10123	14.62	11.90	2.95	14.85	1.13			16.04
11064	12.70	9.39	3.32	12.71	.93			13.65
11065	12.59	9.21	4.74	13.95	.75			14.87
	13.69	10.45	3.43	13.88	1.12			14.93
		10.00	2.00	12.00	1.00			13.00
10262	3.17				24.83	2.64		22.32
11066	3.72				24.80	2.48		21.70
					22.90	2.47		20.71
10263	8.59	7.45	2.97	10.42	1.15	1.52	1.54	19.68
11067	10.58	6.04	4.64	10.68	.97	1.56	1.44	19.86
11068	10.80	5.91	3.74	9.65	1.77	1.76	1.51	19.54
	9.99	6.47	3.78	10.25	1.29	1.61	1.50	19.69
		7.50	2.00	9.50	1.00	1.65	1.50	19.11
10124	11.07	7.50	3.18	10.68	4.85	1.98	.86	20.91
11069	12.95	6.47	4.29	10.76	3.67	1.94	.53	20.37
11070	10.22	7.36	4.35	11.71	2.81	2.01	.54	21.78
	11.41	7.11	3.94	11.05	3.77	1.98	.64	21.02
		8.00	2.00	10.00	1.00	2.00	.30	19.65
10057	11.15	4.41	1.98	6.39	.57	2.87	4.14	22.99
11071	10.38	5.16	2.21	7.37	.63	3.09	4.10	24.93
		3.00	3.00	6.00	1.00	3.00	4.00	22.75
9945	13.88	7.15	2.18	9.33	.72	2.88	2.92	25.14
10236	10.28	6.15	2.32	8.47	2.47	3.63	3.17	27.19
11072	10.07	4.84	3.65	8.49	2.24	3.71	2.90	27.07
11073	11.07	5.63	3.21	8.84	1.29	3.93	3.01	28.49
	11.32	5.94	2.84	8.78	1.68	3.54	3.00	26.97
		5.50	2.00	7.50	1.00	3.85	3.00	26.69
10264	9.36	7.25	2.65	9.90	1.39	1.77	1.63	20.13
11074	9.30	4.64	4.32	8.96	1.07	1.69	1.36	18.22
11075	9.24	5.60	3.90	9.50	1.30	1.68	1.36	18.87
	9.30	5.83	3.62	9.45	1.23	1.71	1.45	19.07
		7.50	2.00	9.50	1.00	1.65	1.50	19.11
11076	10.18	5.78	4.81	10.59	5.27	1.67	.35	18.89
11077	10.90	6.20	4.49	10.69	4.02	1.98	.59	20.48
		8.00	2.00	10.00	1.00	1.65	.35	18.39
9866	14.38	7.52	2.33	9.85	1.37	1.67	1.81	19.93
9867	14.92	7.06	2.56	9.62	.55	1.84	2.18	20.70
9886	15.23	7.04	2.42	9.46	1.18	1.85	1.67	19.97
9946	14.98	8.14	2.33	10.47	1.20	1.47	1.67	19.76
10058	13.80	8.14	2.42	10.56	1.47	1.48	1.80	20.05
10059	12.10	7.55	2.47	10.02	1.32	1.95	1.84	21.21
10125	14.24	7.52	2.64	10.16	.79	1.65	2.20	20.65

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10126	S. G. Royal "C" Brand	Barney Johns & Co., Gloster.....
10265	S. G. Royal "C" Brand	J. W. Grantham & Co., Terry.....
10266	S. G. Royal "C" Brand	Liberty Merc. Co., Liberty.....
10267	S. G. Royal "C" Brand	Blackston Merc. Co., Winona.....
11078	S. G. Royal "C" Brand	Centreville Merc. Co., Centreville.....
11079	S. G. Royal "C" Brand	W. S. Gordon, Pickens.....
11080	S. G. Royal "C" Brand	Vaiden Merc. Co., Vaiden.....
11081	S. G. Royal "C" Brand	Jackson-Wallace Co., Kosciusko.....
11082	S. G. Royal "C" Brand	J. W. McLarty & Co., Water Valley.....
11083	S. G. Royal "C" Brand	McLeod & Co., Purvis.....
11084	S. G. Royal "C" Brand	R. W. Fagan & Co., Waynesboro.....
11085	S. G. Royal "C" Brand	H. A. Busick Co., Brandon.....
11086	S. G. Royal "C" Brand	F. L. Riley Merc. Co., Newhebron.....
11087	S. G. Royal "C" Brand	I. N. Varnado's Sons Co., Osyka.....
11088	S. G. Royal "C" Brand	T. W. Ford & Co., Eupora.....
11089	S. G. Royal "C" Brand	Johnson-Woodward Co., Mt. Olive.....
		Average.....
		Guarantee.....
10268	S. G. German Kainit	Wilson & Boyd, Kilmichael.....
11090	S. G. German Kainit	C. Atkinson's Sons Co., Summit.....
		Guarantee.....
	JEFFERSON FERTILIZER CO., Birmingham, Ala.	
11091	Warrior H. G. Excelsior Acid Phosphate	Steens Bell Warehouse Co., Steens.....
12063	Warrior H. G. Excelsior Acid Phosphate	Steens Bell Warehouse Co., Steens.....
		Guarantee.....
11092	Jefferson H. G. Complete Fert.	R. G. Harris, Steens.....
		Guarantee.....
10269	Warrior H. G. Complete Fert.	Steens Bell Warehouse Co., Steens.....
		Guarantee.....
10270	Warrior H. G. Meal, Acid & Potash Mixture	Steens Bell Warehouse Co., Steens.....
		Guarantee.....
10271	S. G. German Kainit	Steens Bell Warehouse Co., Steens.....
		Guarantee.....
	LAUREL OIL & FERTILIZER CO., Laurel, Miss.	
11093	H. G. Acid Phosphate 16%.....	Abney & Travis, Heidelberg.....
11094	H. G. Acid Phosphate 16%.....	R. F. Waldren & Co., Prentiss.....
		Guarantee.....
9868	H. G. Acid Phosphate 14%.....	Laurel Oil & Fert. Co., Laurel.....
9887	H. G. Acid Phosphate 14%.....	S. M. Hinton, Bay Springs.....
9888	H. G. Acid Phosphate 14%.....	J. T. Lewis, Neshoba.....
9889	H. G. Acid Phosphate 14%.....	J. F. Wilson, Philadelphia.....
11095	H. G. Acid Phosphate 14%.....	J. H. McGowan, Pachuta.....
		Average.....
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10126	14.22	8.92	2.48	11.40	.64	1.54	1.87	\$21.36
10265	12.83	8.65	2.37	11.02	.81	1.59	1.80	21.02
10266	13.01	8.51	2.49	11.00	1.30	1.53	1.63	20.56
10267	8.92	8.01	2.54	10.55	2.83	1.57	1.80	20.36
11078	12.58	7.75	2.32	10.07	1.51	1.48	1.80	19.47
11079	13.60	7.93	3.08	11.01	.77	1.65	1.75	21.10
11080	12.42	6.59	3.98	10.57	2.10	1.66	1.75	20.52
11081	10.06	7.11	3.51	10.62	2.84	1.65	1.81	20.66
11082	13.97	6.56	4.00	10.56	2.33	1.67	1.62	20.40
11083	13.10	6.90	3.80	10.70	2.29	1.58	1.68	20.32
11084	15.31	8.12	3.71	11.83	.59	1.65	1.56	21.81
11085	13.39	6.73	3.70	10.43	2.38	1.67	1.48	20.11
11086	15.70	7.83	3.61	11.44	.35	1.81	1.41	21.78
11087	13.13	6.78	3.63	10.41	2.52	1.62	1.46	19.88
11088	13.54	6.63	3.45	10.08	2.06	1.78	1.92	20.63
11089	12.35	6.58	3.74	10.32	3.11	1.77	1.80	20.72
	13.38	7.50	3.03	10.53	1.58	1.66	1.75	20.58
		7.00	2.50	9.50	1.00	1.65	1.80	19.41
10268	2.68						12.72	14.63
11090	6.56						12.00	13.80
							12.00	13.80
11091	16.27	11.87	2.89	14.76	1.10			15.95
12063	14.33	10.93	3.24	14.17	.41			15.26
		11.50	4.50	16.00	2.00			17.15
11092	14.70	7.92	2.37	10.29	1.48	1.76	1.54	20.48
		7.00	3.00	10.00	2.00	1.65	2.00	20.19
10269	14.64	8.06	1.94	10.00	1.52	1.55	2.03	19.95
		7.00	3.00	10.00	2.00	1.65	2.00	20.19
10270	17.79	8.12	1.47	9.59	1.34	1.53	1.98	19.38
		7.00	3.00	10.00	2.00	1.65	2.00	20.19
10271	2.85						12.52	14.40
							12.00	13.80
11093	13.75	12.61	3.72	16.33	.70			17.59
11094	12.81	10.25	5.77	16.02	.77			17.05
		13.00	3.00	16.00	2.00			17.30
9868	12.82	12.61	2.31	14.92	2.41			16.18
9887	11.50	13.82	2.80	16.62	1.85			18.00
9888	10.79	12.10	3.35	15.45	2.51			16.66
9889	13.43	11.04	3.81	14.85	2.23			15.95
11095	14.68	10.29	4.96	15.25	.95			16.28
	12.64	11.97	3.45	15.42	1.99			16.61
		12.00	2.00	14.00	2.00			15.20

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10127	S. G. K. C. Ammoniated Bone	E. B. Perry, Taylorsville.....
11096	S. G. K. C. Ammoniated Bone	W. W. Pigford, Lumberton.....
		Guarantee.....
10060	S. G. Meal and Phosphate Mixture	W. D. Miller, Louisville.....
10272	S. G. Meal and Phosphate Mixture	T. B. Bonner Co., Laurel.....
11097	S. G. Meal and Phosphate Mixture	T. F. Abney, Montrose.....
		Average.....
		Guarantee.....
9869	S. G. Plow Brand	Laurel Oil & Fert. Co., Laurel.....
9890	S. G. Plow Brand	J. F. Wilson, Philadelphia.....
9891	S. G. Plow Brand	J. T. Lewis, Neshoba.....
9892	S. G. Plow Brand	S. M. Hinton, Bay Springs.....
10128	S. G. Plow Brand	W. W. Pigford, Lumberton.....
11098	S. G. Plow Brand	McLean-King Co., Bassfield.....
11099	S. G. Plow Brand	W. M. Conner, Hattiesburg.....
		Average.....
		Guarantee.....
10129	S. G. German Kainit	J. H. McGowan, Pachuta.....
		Guarantee.....
	LOTTERHOS & HUBER CO., Crystal Springs, Miss.	
10061	Castor Pomace.....	Lotterhos & Huber Co., Crystal Sp'gs
11100	Castor Pomace.....	Lotterhos & Huber Co., Crystal Sp'gs
		Guarantee.....
	MARBACH & EAGAN, Crystal Springs, Miss.	
10062	Bat Guano	Lotterhos & Huber Co., Crystal Sp'gs
11101	Bat Guano	Lotterhos & Huber Co., Crystal Sp'gs
		Guarantee.....
	MERIDIAN FERTILIZER FACTORY Meridian, Miss.	
9947	S. G. Meridian English Acid Phosphate	T. B. Gaddis, Morton.....
10131	S. G. Meridian English Acid Phosphate	R. Watts & Co., Seminary.....
10273	S. G. Meridian English Acid Phosphate	E. A. Smith, Ridgeland.....
11102	S. G. Meridian English Acid Phosphate	F. H. Deas, Enterprise.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10127	13.54	8.39	2.69	11.08	1.41	1.53	2.39	\$21.51
11096	13.87	7.13	4.36	11.49	1.71	1.04	1.47	18.94
		8.00	2.00	10.00	2.00	1.00	2.00	17.85
10060	11.18	7.87	2.78	10.65	1.88	2.08	.61	21.00
10272	8.69	7.60	3.81	11.41	1.91	2.09	.56	21.79
11097	10.74	7.18	3.79	10.97	1.89	2.23	.50	21.72
	10.20	7.55	3.46	11.01	1.89	2.13	.56	21.50
		7.50	2.00	9.50	2.00	2.00	.50	19.28
9869	12.65	8.09	2.88	10.97	1.88	1.71	1.74	21.29
9890	13.21	7.57	2.62	10.21	1.92	1.78	1.59	20.49
9891	11.25	8.06	2.38	10.44	2.03	1.73	1.71	20.74
9892	14.09	8.01	2.71	10.72	1.87	1.79	1.58	21.12
10128	14.20	7.50	2.32	9.82	1.98	1.64	2.09	20.11
11098	13.60	6.96	3.46	10.42	1.47	1.69	1.76	20.52
11099	14.03	6.83	3.41	10.24	1.48	1.66	1.66	20.08
	13.29	7.58	2.82	10.40	1.80	1.71	1.73	20.62
		7.50	2.00	9.50	2.00	1.65	1.50	19.11
10129	5.67						13.48	15.50
							12.00	13.80
10061	9.03				1.51	4.44	.90	18.44
11100	10.11				1.74	4.73	.86	19.60
					1.50	4.50	.50	18.20
10062	17.55				10.44	4.59	.77	23.32
11101	13.70				8.73	3.90	.92	20.05
					1.50	4.50	.50	18.20
9947	14.26	7.88	4.71	12.59	2.58			13.38
10131	13.14	8.15	2.95	11.10	.90			11.92
10273	11.94	10.08	3.55	13.63	1.24			14.64
11102	16.16	9.02	5.53	14.55	.75			15.45

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11103	S. G. Meridian English Acid Phosphate	F. M. Brooks Merc. Co., Magee..... Average
9870	H. G. Meridian Southern Acid Phosphate	Meridian Fertilizer Factory, Meridian
9871	H. G. Meridian Southern Acid Phosphate	T. M. Steele & Son, Forest.....
9893	H. G. Meridian Southern Acid Phosphate	T. M. Steele & Son, Forest.....
9894	H. G. Meridian Southern Acid Phosphate	W. B. Richardson, Newton.....
9895	H. G. Meridian Southern Acid Phosphate	W. M. Pilgrim, Philadelphia.....
9896	H. G. Meridian Southern Acid Phosphate	J. N. Tabor, Louisville.....
9948	H. G. Meridian Southern Acid Phosphate	Story & Co., Forest.....
9949	H. G. Meridian Southern Acid Phosphate	George Robinson, Pelahatchie.....
10274	H. G. Meridian Southern Acid Phosphate	Johnson-Hand Co., Ellisville.....
10529	H. G. Meridian Southern Acid Phosphate	McLain & Tatum, Gloster.....
11104	H. G. Meridian Southern Acid Phosphate	R. L. Ethridge, Pachuta
11105	H. G. Meridian Southern Acid Phosphate	Ford Bros., Centreville.....
11106	H. G. Meridian Southern Acid Phosphate	Bramlett Hardware Co., Corinth.....
11107	H. G. Meridian Southern Acid Phosphate	Duke Merc. Co., Scooba..... Average
10063	H. G. Meridian Union Special Acid Phosphate	J. N. Tabor, Louisville.....
10275	H. G. Meridian Union Special Acid Phosphate	J. W. Ray, Canton.....
11108	H. G. Meridian Union Special Acid Phosphate	Parkman & Byrd, Mt. Olive.....
11109	H. G. Meridian Union Special Acid Phosphate	R. G. Harris, Steens.....
11110	H. G. Meridian Union Special Acid Phosphate	Bonds, Youngblood & Co., Baldwyn....
11111	H. G. Meridian Union Special Acid Phosphate	F. M. Brooks Merc. Co., Magee.....
11112	H. G. Meridian Union Special Acid Phosphate	H. Ingram, Kilmichael.....
11113	H. G. Meridian Union Special Acid Phosphate	Holloway & Worthy, Carson.

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11103	11.78	6.87	6.52	13.39	.83			\$14.08
	13.46	8.40	4.65	13.05	1.26			13.89
		10.00	2.00	12.00	1.00			13.00
9870	13.13	11.23	3.58	14.81	2.41			15.93
9871	9.89	12.03	3.77	15.80	1.18			17.00
9893	14.93	8.88	4.68	13.56	1.97			14.45
9894	13.92	9.42	4.53	13.95	1.84			14.89
9895	14.34	9.88	3.85	13.73	2.28			14.72
9896	14.15	10.29	2.84	13.13	1.80			14.16
9948	13.94	9.70	4.53	14.23	2.23			15.20
9949	14.01	11.22	4.18	15.40	2.19			16.52
10274	12.08	12.40	3.07	15.47	1.42			16.71
10529	14.02	8.98	4.79	13.77	2.26			14.67
11104	13.09	9.26	6.12	15.38	.29			16.31
11105	12.99	9.75	6.31	16.06	.13			17.04
11106	10.71	9.11	6.33	15.44	.84			16.35
11107	15.62	8.88	5.01	13.89	1.20			14.78
	13.34	10.07	4.54	14.61	1.57			15.62
		12.00	2.00	14.00	1.00			15.20
10063	16.79	14.61	2.21	16.82	.35			18.28
10275	11.69	13.00	3.45	16.45	1.11			17.75
11108	14.76	11.94	4.33	16.27	.56			17.46
11109	13.78	10.08	6.20	16.28	.27			17.29
11110	15.01	10.62	5.24	15.66	.59			16.72
11111	14.59	10.99	4.44	15.43	.69			16.53
11112	13.60	10.76	5.89	16.65	.33			17.73
11113	14.17	10.89	4.72	15.61	.79			16.70

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11114	H. G. Meridian Union Special Acid Phosphate	James McClure, Fayette.....
11115	H. G. Meridian Union Special Acid Phosphate	A. D. Crenshaw & Sons, Neshoba..... Average..... Guarantee.....
10132	S. G. Meridian Blood & Bone..	R. Watts & Co., Seminary.....
10276	S. G. Meridian Blood & Bone..	T. W. Ford & Co., Eupora.....
11116	S. G. Meridian Blood & Bone..	E. A. Smith, Ridgeland.....
11117	S. G. Meridian Blood & Bone..	Berry & Murray, Star.....
11118	S. G. Meridian Blood & Bone..	Mrs. R. J. Briggs, State Line.....
11119	S. G. Meridian Blood & Bone..	E. P. Brown, Lockart.....
11120	S. G. Meridian Blood & Bone..	I. N. Varnado's Sons Co., Osyka.....
11121	S. G. Meridian Blood & Bone..	S. A. Clay & Sons, Stallo..... Average..... Guarantee.....
9872	S. G. Meridian Home Mixture..	T. M. Steele & Son, Forest.....
9873	S. G. Meridian Home Mixture..	Meridian Fertilizer Factory, Meridian
9897	S. G. Meridian Home Mixture..	J. N. Tabor, Louisville.....
9898	S. G. Meridian Home Mixture..	W. M. Pilgrim, Philadelphia.....
9899	S. G. Meridian Home Mixture..	W. B. Richardson, Newton.....
9950	S. G. Meridian Home Mixture..	George Robinson, Pelahatchie.....
9951	S. G. Meridian Home Mixture..	T. B. Gaddis, Morton.....
9952	S. G. Meridian Home Mixture..	John McGrath & Sons, Brookhaven...
10064	S. G. Meridian Home Mixture..	Ross Bros. & Summer, Pelahatchie...
10065	S. G. Meridian Home Mixture..	H. P. Gates Merc. Co., Magee.....
10133	S. G. Meridian Home Mixture..	B. L. Etheridge, Pachuta.....
10200	S. G. Meridian Home Mixture..	R. G. Harris, Steens.....
10201	S. G. Meridian Home Mixture..	L. L. Denson, Bay Springs.....
10277	S. G. Meridian Home Mixture..	J. L. Royals, Louin.....
10278	S. G. Meridian Home Mixture..	Kennedy & Co., Wiggins.....
10279	S. G. Meridian Home Mixture..	Hitt-Hart & Blackstone Co., Winona
10280	S. G. Meridian Home Mixture..	J. N. Alexander & Co., Kosciusko.....
10281	S. G. Meridian Home Mixture..	Duke Merc. Co., Scooba.....
10530	S. G. Meridian Home Mixture..	McLain & Tatum, Gloster.....
10837	S. G. Meridian Home Mixture..	G. P. Magee & Sons, Gloster.....
10884	S. G. Meridian Home Mixture..	Ginn McDonald Co., Tylertown.....
11122	S. G. Meridian Home Mixture..	J. H. Williams & Sons, Prentiss.....
11123	S. G. Meridian Home Mixture..	Hawkins, McRaney Co., Bassfield.....
11124	S. G. Meridian Home Mixture..	Donald Bros., Magee.....
11125	S. G. Meridian Home Mixture..	G. Lowenberg, McCool.....
11126	S. G. Meridian Home Mixture..	St. Clair & Talley, Mathiston.....
11127	S. G. Meridian Home Mixture..	Johnson-Hand Co., Ellisville.....
11128	S. G. Meridian Home Mixture..	Ford Bros., Centreville.....
11129	S. G. Meridian Home Mixture..	Bramlett Hardware Co., Corinth.....
11130	S. G. Meridian Home Mixture..	W. S. Johnson & Sons, Verona.....
11131	S. G. Meridian Home Mixture..	J. K. Kirkland, Quitman.....
11132	S. G. Meridian Home Mixture..	Kennedy & Co., Wiggins.....
11133	S. G. Meridian Home Mixture..	N. G. McGarr, Tomnolen.....
11134	S. G. Meridian Home Mixture..	Sumrall Mercantile Co., Sumrall

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11114	14.08	10.46	5.68	16.14	.22			\$17.19
11115	14.28	10.48	5.65	16.13	.20			17.18
	14.27	11.38	4.76	16.14	.51			17.28
		<i>13.00</i>	<i>3.00</i>	<i>16.00</i>	<i>1.00</i>			<i>17.30</i>
10132	11.03	7.27	3.08	10.35	.77	2.03	2.08	22.12
10276	10.33	6.00	4.33	10.33	1.92	1.74	2.37	21.21
11116	9.50	5.45	4.55	10.00	.82	1.54	1.67	19.24
11117	10.21	5.69	4.56	10.25	.96	1.43	1.68	19.14
11118	13.73	6.14	4.49	10.63	1.56	1.47	2.09	20.22
11119	14.81	5.59	4.22	9.81	1.51	1.71	1.85	19.89
11120	10.05	6.54	4.28	10.82	1.41	1.34	1.47	19.27
11121	12.51	6.33	4.50	10.83	1.27	1.32	1.69	19.44
	11.52	6.13	4.25	10.38	1.28	1.57	1.86	20.07
		<i>7.00</i>	<i>3.00</i>	<i>10.00</i>	<i>1.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.61</i>
9872	12.22	7.30	2.84	10.14	2.25	1.69	1.75	20.23
9873	12.26	6.86	2.91	9.77	2.35	1.57	1.67	19.24
9897	13.78	8.03	2.09	10.12	1.56	1.48	1.43	19.13
9898	14.15	4.67	3.18	7.85	2.67	1.65	1.62	17.15
9899	13.86	5.40	3.25	8.65	2.24	1.68	1.66	18.26
9950	12.96	5.28	4.05	9.33	2.41	1.71	2.09	19.61
9951	15.23	5.77	3.83	9.60	1.79	1.56	1.86	19.13
9952	14.90	7.91	2.92	10.83	1.20	1.34	1.98	20.01
10064	11.59	7.91	3.36	11.27	1.61	1.28	1.93	20.21
10065	13.33	8.16	2.43	10.59	1.55	1.39	1.35	19.23
10133	15.17	8.50	2.55	11.05	1.07	1.63	1.91	21.31
10200	16.09	7.93	2.07	10.00	1.80	1.84	1.51	20.43
10201	13.18	7.11	2.71	9.82	1.43	1.68	2.14	20.27
10277	11.98	6.90	3.06	9.96	1.30	1.88	1.82	20.79
10278	13.22	7.09	2.39	9.48	1.39	1.59	1.62	18.96
10279	10.64	7.30	2.85	10.15	1.43	1.76	1.50	20.22
10280	12.48	6.98	3.06	10.04	1.38	1.67	1.56	19.80
10281	14.30	8.03	2.72	10.75	1.05	1.67	1.88	21.05
10530	14.29	8.89	2.98	11.87	1.14	1.88	1.72	22.97
10837	13.61	8.24	3.69	11.93	1.04	1.77	1.82	22.68
10884	16.76	6.79	2.28	9.07	1.57	1.83	1.76	19.54
11122	13.46	6.68	3.77	10.45	.52	1.91	1.66	21.23
11123	13.79	7.00	4.78	11.78	.42	1.62	1.71	21.70
11124	13.36	7.39	4.31	11.70	.50	1.54	1.50	21.11
11125	14.18	7.85	3.46	11.31	.26	1.57	1.52	20.86
11126	11.92	7.38	3.13	10.51	.67	1.83	1.66	21.07
11127	12.86	7.34	3.89	11.23	.47	1.50	1.85	20.84
11128	12.78	7.51	4.52	12.03	.64	1.55	1.57	21.60
11129	17.68	5.72	4.73	10.45	.42	1.87	1.26	20.53
11130	15.30	6.73	3.99	10.72	.87	1.69	1.51	20.54
11131	14.66	6.42	4.47	10.89	.52	1.56	1.52	20.22
11132	13.78	7.98	4.28	12.26	.46	1.54	1.15	21.38
11133	13.34	7.92	4.53	12.45	.50	1.60	1.54	22.26
11134	14.39	7.51	3.81	11.32	.41	2.09	1.78	23.09

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11135	S. G. Meridian Home Mixture..	Stewart & Hemiter, Gandsi.....
11136	S. G. Meridian Home Mixture..	The Cooke Co., Mendenhall.....
11137	S. G. Meridian Home Mixture..	W. S. Gordon, Pickens.....
11138	S. G. Meridian Home Mixture..	Jeff Griffis Merc. Co., Beaumont.....
11139	S. G. Meridian Home Mixture..	M. N. McCoy, Poplarville.....
11140	S. G. Meridian Home Mixture..	J. A. McLeod Co., Hattiesburg.....
11141	S. G. Meridian Home Mixture..	Perkins & Co., Brooklyn.....
11142	S. G. Meridian Home Mixture..	W. M. Pilgrim, Philadelphia.....
11143	S. G. Meridian Home Mixture..	Heidelberg Gin & Wse. Co., Heidelberg.....
11145	S. G. Meridian Home Mixture..	Story & Co., Forest.....
		Average.....
		Guarantee.....
11144	S. G. Meridian Meal Mixture....	D. C. Coney, Bogue Chitto.....
11146	S. G. Meridian Meal Mixture....	J. H. McGrath & Sons, Brookhaven....
11147	S. G. Meridian Meal Mixture....	M. H. Turner, Vossburg.....
		Average.....
		Guarantee.....
9953	S. G. Meridian Soluble Guano..	H. N. Stuart, Morton.....
11148	S. G. Meridian Soluble Guano..	H. H. Little Co., Mize.....
		Guarantee.....
10134	H. G. Meridian Veg. Grower ..	Holloway & McRaney, Collins.....
10282	H. G. Meridian Veg. Grower ..	Barnes & Co., Columbia.....
11149	H. G. Meridian Veg. Grower ..	E. A. Smith, Ridgeland.....
		Average.....
		Guarantee.....
10135	S. G. Meridian German Kainit	Ford Bros., Centreville.....
11150	S. G. Meridian German Kainit	R. G. Harris, Steens.....
11151	S. G. Meridian German Kainit	M. W. Buckley & Son, Enterprise.....
		Average.....
		Guarantee.....
MISSISSIPPI FERTILIZER CO., Jackson, Miss.		
9954	H. G. Acid Phosphate 16%.....	Miss. Fertilizer Co., Jackson.....
10283	H. G. Acid Phosphate 16%.....	Z. Wardlaw, Utica.....
		Guarantee.....
10066	H. G. Acid Phosphate 14%.....	J. L. Hammond, Kosciusko.....
10136	H. G. Acid Phosphate 14%.....	Summer Bros., Morton.....
11152	H. G. Acid Phosphate 14%.....	F. L. Riley Merc. Co., New Hebron....
		Average.....
		Guarantee.....
10067	S. G. Horse Shoe Brand.....	J. L. Hammond, Kosciusko.....
10137	S. G. Horse Shoe Brand.....	J. D. Gambrell & Son, Mize.....
10284	S. G. Horse Shoe Brand.....	S. Kemp, Hazlehurst.....
11153	S. G. Horse Shoe Brand.....	Smythe, Gaddis & Co., Forest.....
		Average.....
		Guarantee.....
10285	S. G. Improved Miss. Mixture.	C. Atkinson's Sons Co., Summit.....
11154	S. G. Improved Miss. Mixture.	E. H. Curry & Bro., Utica.....
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11135	12.46	7.36	3.82	11.18	.50	2.08	1.67	\$22.75
11136	13.60	7.41	3.92	11.33	.38	1.79	1.60	21.76
11137	15.07	7.47	2.58	10.05	.83	1.80	1.80	20.62
11138	13.27	7.61	3.68	11.29	.68	1.81	1.37	21.54
11139	14.10	7.28	3.49	10.77	.60	1.72	1.50	20.75
11140	13.28	7.48	4.12	11.60	.54	1.68	1.38	21.40
11141	13.44	7.91	4.32	12.23	.42	1.66	1.73	22.46
11142	14.06	8.14	2.55	10.69	.61	1.70	1.59	20.78
11143	15.61	7.23	3.31	10.54	.77	1.99	1.51	21.52
11145	15.49	7.50	4.31	11.81	.82	1.28	1.42	20.17
	13.81	7.27	3.43	10.70	1.07	1.68	1.64	20.69
		8.00	2.00	10.00	1.00	1.65	1.50	19.71
11144	11.03	7.46	3.80	11.26	1.07	2.00	.64	21.37
11146	11.48	7.68	2.82	10.50	1.09	2.22	.57	21.30
11147	11.09	7.36	3.68	11.04	.56	2.19	.66	21.85
	11.20	7.50	3.43	10.93	.91	2.14	.62	21.51
		7.00	3.00	10.00	1.00	2.00	.50	19.78
9953	13.61	6.68	3.60	10.28	2.78	1.18	1.62	18.26
11148	12.75	6.96	4.04	11.00	.55	1.83	1.50	21.38
		7.00	2.50	9.50	1.00	1.40	1.50	18.13
10134	12.99	6.55	2.47	9.02	1.19	2.42	5.15	25.57
10282	11.82	6.69	2.55	9.24	1.14	2.14	5.75	25.47
11149	12.11	6.31	3.19	9.50	.45	2.35	4.76	25.37
	12.31	6.52	2.74	9.26	.93	2.30	5.22	25.47
		6.00	2.00	8.00	1.00	2.50	5.00	24.53
10135	6.17						12.74	14.65
11150	4.50						12.18	14.01
11151	5.53						12.74	14.65
	5.40						12.55	14.44
							12.00	13.80
9954	10.42	14.05	2.94	16.99	1.45			18.40
10283	11.33	11.86	3.84	15.70	1.34			16.89
		13.00	3.00	16.00	1.00			17.30
10066	12.70	11.80	2.88	14.68	1.84			15.86
10136	12.36	11.10	3.24	14.34	1.56			15.45
11152	11.88	12.50	3.18	15.68	1.27			16.93
	12.31	11.80	3.10	14.90	1.56			16.08
		12.00	2.00	14.00	1.00			15.20
10067	10.06	7.48	2.73	10.21	.67	1.82	1.73	20.79
10137	9.93	7.37	2.27	9.64	1.07	1.66	2.42	20.35
10284	8.01	7.54	2.41	9.95	.92	1.40	2.35	19.65
11153	10.30	7.11	3.01	10.12	.43	1.57	2.09	20.13
	9.57	7.38	2.60	9.98	.77	1.61	2.15	20.23
		7.50	2.00	9.50	1.00	1.65	1.80	19.46
10285	8.75	7.57	2.40	9.97	1.19	1.68	2.15	20.50
11154	10.61	6.98	2.67	9.65	.42	1.51	1.95	19.22
		7.50	2.00	9.50	1.00	1.65	1.80	19.46

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	MT. PLEASANT FERTILIZER CO., Mt. Pleasant, Tenn.	
9900	H. G. Big Success Dissolved Bone 16%.....	Mott & Wilson, Union.....
10068	H. G. Big Success Dissolved Bone 16%.....	M. J. Lewis Co., Louisville.....
11155	H. G. Big Success Dissolved Bone 16%.....	Mott & Wilson, Union..... Average Guarantee.....
10069	O. G. Big Success Cot. Grower	M. J. Lewis Co., Louisville..... Guarantee.....
10070	H. G. Soil Builder & Plant Food	M. J. Lewis Co., Louisville..... Guarantee.....
11156	S. G. White as Snow Cotton Special	A. W. Allen, Tupelo.....
11157	S. G. White as Snow Cotton Special	A. W. Allen, Tupelo..... Guarantee.....
	NEW ORLEANS ACID & FERTILIZER COMPANY, New Orleans, La.	
10138	H. G. Acid Phosphate 16%.....	W. C. Ellis & Co., Magee.....
11158	H. G. Acid Phosphate 16%.....	J. E. Dudley, Jr., & Co., Hermanville
11159	H. G. Acid Phosphate 16%.....	J. S. Eaton & Bro., Taylorsville..... Average Guarantee.....
10139	S. G. Black Diamond Acid Phosphate	E. M. Odom, Star.....
10286	S. G. Black Diamond Acid Phosphate	K. Green, Shuqualak.....
11160	S. G. Black Diamond Acid Phosphate	Planters Merc. Co., Woodville..... Average Guarantee.....
11161	S. G. Crescent City Acid Phosphate	J. W. Simmons & Sons, Osyka.....
11162	S. G. Crescent City Acid Phosphate	E. M. Welborn, Stringer..... Guarantee.....
10531	H. G. New Orleans Acid Phosphate	McLain & Tatum, Gloster..... Guarantee.....
9971	S. G. Am. R. B. Superphosphate and Potash	The Rankin Co., Columbia.....
11163	S. G. Am. R. B. Superphosphate and Potash	Beaman & Co., Forest.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9900	11.39	12.11	3.29	15.40	1.37			\$16.61
10068	15.22	14.02	1.78	15.80	1.15			17.20
11155	13.55 13.39	11.80 12.64	3.77 2.95	15.57 15.59	1.07 1.20			16.75 16.85
		14.00	2.00	16.00	2.00			17.40
10069	11.78	6.92 7.00	3.43 3.00	10.35 10.00	6.13 5.00	.88 .82	1.19 1.00	16.75 15.93
10070	11.88	7.64 7.00	2.45 3.00	10.09 10.00	3.99 5.00	1.47 1.65	2.26 2.00	19.97 20.19
11156	9.08	3.86	5.12	8.98	7.04	1.63	1.69	18.32
11157	9.25	6.19 6.00	4.21 2.00	10.40 8.00	6.69 5.00	1.32 1.65	2.05 2.00	19.37 17.89
10138	15.42	10.35	5.42	15.77	1.22			16.81
11158	10.18	12.08	2.83	14.91	.13			16.12
11159	10.30 11.97	9.67 10.70	3.58 3.94	13.25 14.64	.08 .47			14.22 15.72
		12.00	4.00	16.00	2.00			17.20
10139	10.13	11.32	1.35	12.67	.24			13.80
10286	9.24	10.69	1.66	12.35	.51			13.42
11160	8.72 9.36	7.16 9.72	3.72 2.25	10.88 11.97	.40 .38			11.60 12.94
		10.00	2.00	12.00	2.00			13.00
11161	5.56	8.70	3.33	12.03	.29			12.90
11162	9.49	8.72 10.00	3.64 2.00	12.36 12.00	.32 2.00			13.23 13.00
10531	12.76	12.15 12.00	1.80 2.00	13.95 14.00	.51 2.00			15.17 15.20
9971	11.60	8.90	.94	9.84	.13	1.45	1.71	19.12
11163	10.90	8.49	1.38	9.87	.18	1.43	1.54	18.84

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11164	S. G. Am. R. B. Superphosphate and Potash	Dunagin-Whitaker Co., Laurel.....
12071	S. G. Am. R. B. Superphosphate and Potash	McLeod & Dansler, VanCleave.....
12072	S. G. Am. R. B. Superphosphate and Potash	L. L. Denson, Bay Springs.....
12073	S. G. Am. R. B. Superphosphate and Potash	J. S. Eaton & Bro., Taylorsville.....
12074	S. G. Am. R. B. Superphosphate and Potash	J. W. Simmons & Sons, Osyka.....
		Average
		Guarantee.....
10140	S. G. Blood, Bone and Beef ...	S. S. Dale & Sons, Prentiss.....
11165	S. G. Blood, Bone and Beef ...	E. M. Odom, Star.....
		Guarantee.....
11166	S. G. Blood, Bone and Potash	Dorsett & Co., Richton.....
12076	S. G. Blood, Bone and Potash	K. Green & Co., Shuqualak.....
12077	S. G. Blood, Bone and Potash	E. M. Welborn, Stringer.....
		Average
		Guarantee.....
10141	H. G. Economizer	W. C. Ellis & Co., Magee.....
11167	H. G. Economizer	Donald Bros., Magee.....
12078	H. G. Economizer	S. E. Dudley, Jr. & Co., Hermanville.....
		Average
		Guarantee.....
11168	H. G. Farmer's Cornucopia ...	Osyka Supply Co., Osyka.....
		Guarantee.....
11169	S. G. Gold Dust.....	Summer Bros., Morton.....
11170	S. G. Gold Dust.....	Osyka Merc. Co., Osyka.....
		Guarantee.....
9972	S. G. Goldsmith's Improved Mixture	The Rankin Co., Columbia.....
10142	S. G. Goldsmith's Improved Mixture	W. C. Ellis & Co., Magee.....
10287	S. G. Goldsmith's Improved Mixture	Hickman, Son & Butler, Monticello....
10532	S. G. Goldsmith's Improved Mixture	McLain & Tatum, Gloster.....
11171	S. G. Goldsmith's Improved Mixture	T. J. Reddoch, Bassfield.....
11172	S. G. Goldsmith's Improved Mixture	Hickman Son & Butler, Monticello....
11173	S. G. Goldsmith's Improved Mixture	E. P. Donald & Son, Philadelphia.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11164	10.01	7.33	2.36	9.69	.26	1.03	1.17	\$16.60
12071	9.30	7.35	2.67	10.02	.38	1.30	1.45	18.30
12072	8.13	8.76	2.17	10.93	.40	1.15	1.38	18.80
12073	8.39	6.98	1.94	8.92	.29	1.64	1.77	18.70
12074	9.38	7.26	2.39	9.65	.26	1.60	1.44	19.00
	9.67	7.87	1.98	9.85	.27	1.37	1.49	18.48
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>18.51</i>
10140	13.11	8.46	1.06	9.52	.24	1.46	1.67	18.71
11165	10.00	8.34	1.55	9.89	.46	1.52	1.38	19.00
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>18.51</i>
11166	11.60	6.88	2.86	9.74	.29	1.18	1.20	17.21
12076	9.82	7.70	2.01	9.71	.24	1.53	1.37	18.76
12077	7.78	6.45	2.76	9.21	.22	1.43	1.29	17.62
	9.73	7.01	2.54	9.55	.25	1.38	1.29	17.86
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>18.51</i>
10141	13.31	6.73	4.26	10.99	.95	1.47	2.12	20.71
11167	13.45	6.09	5.70	11.79	.52	1.09	1.35	19.22
12078	12.18	6.90	4.82	11.72	.41	1.37	1.77	20.76
	12.98	6.57	4.93	11.50	.62	1.31	1.75	20.23
		<i>8.00</i>	<i>2.00</i>	<i>10.00</i>	<i>2.00</i>	<i>1.65</i>	<i>2.00</i>	<i>20.29</i>
11168	11.54	11.03	1.07	12.10	1.16	2.14	2.56	25.38
		<i>10.00</i>	<i>2.00</i>	<i>12.00</i>	<i>2.00</i>	<i>2.47</i>	<i>2.00</i>	<i>25.76</i>
11169	12.20	7.60	1.39	8.99	.58	1.75	1.39	18.81
11170	11.93	7.39	2.39	9.78	.40	1.48	1.36	18.61
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>18.51</i>
9972	11.40	6.08	4.00	10.08	1.00	1.48	1.21	18.64
10142	11.96	5.74	3.88	9.62	.64	1.63	1.64	19.15
10287	11.88	6.56	2.66	9.22	.96	1.64	1.20	18.33
10532	12.69	7.11	2.49	9.60	1.01	1.53	1.63	18.88
11171	12.81	5.72	4.37	10.09	.72	1.49	1.19	18.63
11172	11.20	5.96	3.64	9.60	.69	1.75	1.26	19.17
11173	10.98	7.16	1.20	8.36	.27	1.76	1.51	18.25
	11.84	6.33	3.18	9.51	.76	1.61	1.38	18.72
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>18.51</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10288	H. G. Vegetable Grower	Rankin & Co., Columbia.....
		Guarantee.....
11174	S. G. German Kainit	McLain & Tatum, Gloster.....
		Guarantee.....
	NITRATE AGENCIES COMPANY,	
	New Orleans, La.	
10289	H. G. Nitrate of Soda	O. Hopkins, Hickory.....
		Guarantee.....
	NEWTON OIL & M'F'G. COMPANY,	
	Newton, Miss.	
10071	H. G. Acid Phosphate 16%.....	Farmers Union Warehouse Co., Forest
11175	H. G. Acid Phosphate 16%.....	Farmers Union Warehouse Co., Forest
		Guarantee.....
10072	H. G. Acid Phosphate 14%.....	Newton Oil & Mfg. Co., Newton.....
11176	H. G. Acid Phosphate 14%.....	M. A. Metts, Louisville.....
		Guarantee.....
9901	S. G. Banner C. & C. Brand	Newton Oil & Mfg. Co., Newton.....
9902	S. G. Banner C. & C. Brand	F. L. White, Philadelphia.....
10143	S. G. Banner C. & C. Brand	Farmers Union Warehouse Co., Forest
11177	S. G. Banner C. & C. Brand	Z. T. Harrison, Hickory.....
		Average
		Guarantee.....
	PLANTERS FERTILIZER & CHEM-	
	ICAL COMPANY,	
	New Orleans, La.	
11178	S. G. Planters Golden Mixture	Cobb & Tillery, Rosetta.....
11179	S. G. Planters Golden Mixture	J. & S. Anderson, Van Cleave.....
		Guarantee.....
9955	S. G. Planters R. B. Super-	
	phosphate	Wm. Atkinson & McDonald Co., Wess'n
10290	S. G. Planters R. B. Super-	
	phosphate	A. Scofide, Bay St. Louis.....
11180	S. G. Planters R. B. Super-	
	phosphate	Robinson Merc. Co., Centreville.....
		Average
		Guarantee.....
	PLANTERS OIL MILL & GIN CO.,	
	Kosciusko, Miss.	
9973	H. G. Acid Phosphate	Planters Oil Mill & Gin Co., Kosciusko
10291	H. G. Acid Phosphate	J. B. Triplett, McCool.....
11181	H. G. Acid Phosphate	J. W. Black, Ethel.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10288	9.52	4.84 <i>4.00</i>	2.65 <i>2.00</i>	7.49 <i>6.00</i>	.78 <i>2.00</i>	2.02 <i>2.47</i>	3.69 <i>4.00</i>	\$20.54 <i>20.86</i>
11174	4.98						12.60 <i>12.00</i>	14.49 <i>13.80</i>
10289	1.29					15.08 <i>15.00</i>		56.55 <i>56.25</i>
10071	13.36	12.70	3.38	16.08	1.54			17.35
11175	11.27	9.44 <i>14.00</i>	6.30 <i>2.00</i>	15.74 <i>16.00</i>	2.23 <i>1.00</i>			16.68 <i>17.40</i>
10072	14.12	12.67	2.76	15.43	1.77			16.70
11176	13.55	9.33 <i>12.00</i>	6.62 <i>2.00</i>	15.95 <i>14.00</i>	.96 <i>2.00</i>			16.88 <i>15.20</i>
9901	14.16	5.21	3.43	8.64	.78	1.79	2.27	19.35
9902	13.05	6.93	2.55	9.48	1.74	1.53	2.24	19.43
10143	13.88	7.07	2.66	9.73	1.65	1.58	2.18	19.84
11177	14.83	6.75	2.78	9.53	1.56	1.51	1.56	18.61
	13.98	6.49 <i>7.00</i>	2.85 <i>1.50</i>	9.34 <i>8.50</i>	1.43 <i>1.50</i>	1.60 <i>1.65</i>	2.07 <i>2.25</i>	19.31 <i>18.82</i>
11178	16.82	7.10	2.42	9.52	.32	1.63	1.75	19.31
11179	14.24	8.09 <i>7.00</i>	2.25 <i>2.50</i>	10.34 <i>9.50</i>	.36 <i>2.00</i>	1.88 <i>1.65</i>	1.69 <i>1.50</i>	21.18 <i>19.06</i>
9955	11.32	7.77	3.43	11.20	1.07	1.56	1.59	20.78
10290	12.78	5.99	4.43	10.42	.88	1.76	1.37	20.24
11180	10.87	3.72	6.87	10.59	.68	1.58	1.58	19.76
	11.69	5.83 <i>7.00</i>	4.91 <i>2.50</i>	10.74 <i>9.50</i>	.87 <i>2.00</i>	1.63 <i>1.65</i>	1.51 <i>1.50</i>	20.26 <i>19.06</i>
9973	12.50	11.68	2.04	13.72	2.25			14.89
10291	10.56	11.72	2.81	14.53	1.47			15.70
11181	12.21	11.14	3.10	14.24	1.37			15.35
	11.76	11.51 <i>11.00</i>	2.65 <i>3.00</i>	14.16 <i>14.00</i>	1.69 <i>1.00</i>			15.31 <i>15.10</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
9974	S. G. Peerless Guano	W. B. Potts & Sons, Kosciusko.....
10292	S. G. Peerless Guano	Jackson-Wallace Co., Kosciusko.....
11182	S. G. Peerless Guano	Bennett Bros., Louisville.....
11183	S. G. Peerless Guano	Henderson-Molphus Co., Philadelphia Average
		Guarantee.....
9975	S. G. German Kainit	Planters Oil Mill & Gin Co., Kosciusko Guarantee.....
	READ PHOSPHATE COMPANY, Nashville, Tenn.	
10293	Read's H. G. Acid Phosphate 14%.....	Henry Vaughn, Steens.....
11184	Read's H. G. Acid Phosphate 14%.....	N. C. Moore & Co., Enterprise..... Guarantee.....
10294	Read's S. G. Blood and Bone No. 1	Gallaspv Bros. & Co., Union.....
11185	Read's S. G. Blood and Bone No. 1	Ruffin Merc. Co., Ellisville..... Guarantee.....
10295	Read's S. G. Nitro Phospho Potasso	Gallaspv Bros. & Co., Union.....
11186	Read's S. G. Nitro Phospho Potasso	Ruffin Merc. Co., Ellisville..... Guarantee.....
	REFUGE COTTON OIL COMPANY, Columbus, Miss.	
10144	Refuge H. G. Acid Phosphate	E. P. Donald & Son, Philadelphia.....
10296	Refuge H. G. Acid Phosphate	J. A. Mayfield, Amory.....
11187	Refuge H. G. Acid Phosphate	Eupora Farmers Union Warehouse Co., Eupora..... Average
		Guarantee.....
9903	S. G. Columbus Home Made Fertilizer.....	E. P. Donald & Son, Philadelphia.....
9904	S. G. Columbus Home Made Fertilizer.....	Winston County Union Warehouse Co., Louisville
9905	S. G. Columbus Home Made Fertilizer.....	Refuge Cotton Oil Co., Columbus.....
10297	S. G. Columbus Home Made Fertilizer.....	J. T. McClure, Shuqualak.....
11188	S. G. Columbus Home Made Fertilizer.....	J. W. Carter, Scooba.....
11189	S. G. Columbus Home Made Fertilizer.....	J. H. Hickman, Noxapater..... Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9974	8.98	7.73	3.28	11.01	.84	1.42	1.85	\$20.34
10292	14.62	7.98	3.11	11.09	1.18	1.53	1.94	20.97
11182	14.14	7.15	3.10	10.25	1.07	1.63	1.86	20.24
11183	14.05	7.74	2.82	10.56	.86	1.65	1.64	20.46
	12.95	7.65	3.08	10.73	.99	1.56	1.82	20.50
		8.00	1.50	9.50	1.00	1.67	1.75	19.53
9975	6.13						12.18	14.01
							12.00	13.80
10293	13.14	10.48	4.16	14.64	1.73			15.69
11184	13.36	9.38	4.84	14.22	1.27			15.16
		12.00	2.00	14.00	2.00			15.20
10294	12.38	7.66	3.86	11.52	1.83	1.49	1.53	20.79
11185	13.28	5.13	5.42	10.55	1.04	1.64	1.89	20.44
		8.00	2.00	10.00	2.00	1.65	1.50	19.71
10295	13.79	7.37	3.27	10.64	1.50	1.73	1.51	20.67
11186	11.65	5.46	3.91	9.37	5.95	1.39	1.41	17.69
		8.00	2.00	10.00	2.00	1.65	1.50	19.71
10144	14.04	10.91	5.06	15.97	.84			17.06
10296	12.73	12.19	2.82	15.01	.42			16.23
11187	12.44	9.79	4.96	14.75	.38			15.73
	13.07	10.96	4.28	15.24	.55			16.34
		12.00	2.00	14.00	2.00			15.20
9903	12.78	7.93	2.89	10.82	.86	1.86	1.73	21.66
9904	11.54	7.28	3.57	10.85	.75	1.71	1.80	21.15
9905	11.86	6.77	4.02	10.79	.60	1.60	1.78	20.59
10297	13.90	6.55	3.66	10.21	.63	1.69	1.73	20.21
11188	13.65	6.51	3.15	9.66	.84	1.50	1.75	18.91
11189	13.14	6.98	3.07	10.05	.24	1.47	1.93	19.49
	12.81	7.00	3.39	10.39	.65	1.64	1.78	20.33
		8.00	2.00	10.00	2.00	1.65	1.50	19.71

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
9906	S. G. Columbus Sandy Land Special	Refuge Cotton Oil Co., Columbus.....
9907	S. G. Columbus Sandy Land Special	Winston County Union Warehouse Co., Louisville
10298	S. G. Columbus Sandy Land Special	J. W. Carter, Secooba.....
11190	S. G. Columbus Sandy Land Special	W. A. Parks, Brooksville.....
		Average
		Guarantee.....
	SHUBUTA OIL & M'FG. CO., Shubuta, Miss.	
9976	H. G. Shubuta Acid Phos.....	Shubuta Oil & Mfg. Co., Shubuta.....
11191	H. G. Shubuta Acid Phos.....	Shubuta Oil & Mfg. Co., Shubuta.....
		Guarantee.....
9977	S. G. Shubuta Mixture	Shubuta Oil & Mfg. Co., Shubuta.....
11192	S. G. Shubuta Mixture	Shubuta Oil & Mfg. Co., Shubuta.....
		Guarantee.....
	SOUTHERN OIL & FERTILIZER COMPANY, Meridian, Miss.	
10073	Southern's 20th Century H. G. Acid Phosphate	Philadelphia Merc. Co., Philadelphia
11193	Southern's 20th Century H. G. Acid Phosphate	Miss.-Ala. Co-operative Co., State Line
11194	Southern's 20th Century H. G. Acid Phosphate	Bob Warren, Pelahatchie.....
		Average
		Guarantee.....
9875	Southern's S. G. Acid Phos.	Southern Oil & Fert. Co., Meridian
9876	Southern's S. G. Acid Phos.	Southern Oil & Fert. Co., Meridian....
		Guarantee.....
10074	Southern's S. G. Cot. Grower ..	Philadelphia Merc. Co., Philadelphia...
11195	Southern's S. G. Cot. Grower ..	Evans & Rushing, Morton.....
11196	Southern's S. G. Cot. Grower ..	Morgan & Smiley, Heidelberg.....
		Average
		Guarantee.....
9877	Southern's S. G. Superior Mixture	Southern Oil & Fert. Co., Meridian...
9878	Southern's S. G. Superior Mixture	Southern Oil & Fert. Co., Meridian...
10145	Southern's S. G. Superior Mixture	Webb Merc. Co., Noxapater.....
11197	Southern's S. G. Superior Mixture	Jones County Farmers Union Ware- house Co., Ellisville.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9906	11.72	4.87	3.59	8.46	.50	1.68	3.41	\$20.01
9907	12.24	5.61	3.18	8.79	.46	1.68	3.21	20.22
10298	14.04	5.12	1.80	6.92	.59	1.68	3.80	18.79
11190	12.60	5.62	2.39	8.01	.42	1.49	3.62	19.12
	12.65	5.30	2.74	8.04	.49	1.63	3.51	19.53
		5.00	2.00	7.00	2.00	1.65	4.00	18.99
9976	14.53	11.99	3.63	15.62	.87			16.82
11191	14.95	10.18	4.19	14.37	1.05			15.39
		10.00	4.00	14.00	1.00			15.00
9977	12.60	7.00	2.87	9.87	1.06	1.69	1.82	19.99
11192	12.86	6.31	3.54	9.85	.86	1.67	1.84	19.84
		6.00	3.00	9.00	1.00	1.65	1.60	18.53
10073	13.02	13.71	3.00	16.71	1.62			18.08
11193	14.04	11.22	4.28	15.50	1.01			16.62
11194	15.95	9.81	4.81	14.62	.59			15.60
	14.34	11.58	4.03	15.61	1.07			16.77
		10.00	4.00	14.00	1.00			15.00
9875	11.88	10.75	3.43	14.18	1.97			15.26
9876	15.32	12.03	3.01	15.04	1.70			16.24
		9.00	3.00	12.00	2.00			12.90
10074	12.57	10.17	2.91	13.08	1.22	1.33	2.02	22.72
11195	14.26	7.75	3.76	11.51	.58	1.24	1.28	19.56
11196	13.29	8.29	2.55	10.84	.35	1.33	1.38	19.33
	13.34	8.74	3.07	11.81	.72	1.30	1.56	20.54
		6.00	3.00	9.00	1.00	1.65	2.00	18.99
9877	14.89	7.34	2.92	10.26	1.41	1.79	1.46	20.41
9878	14.88	8.17	2.31	10.48	1.60	1.69	1.71	20.65
10145	13.79	7.61	2.58	10.19	1.38	1.83	1.82	20.93
11197	14.80	8.42	3.23	11.65	1.24	1.08	1.22	19.11
	14.59	7.88	2.76	10.64	1.41	1.60	1.55	20.27
		6.00	3.00	9.00	1.00	1.65	2.00	18.99

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	STANDARD GUANO & CHEMICAL M'F'G. COMPANY, New Orleans, La.	
10146	Stern's H. G. Acid Phosphate 16%.....	Rumble & Wensel Co., Natchez.....
10299	Stern's H. G. Acid Phosphate 16%.....	Simpson Merc. Co., Terry.....
11198	Stern's H. G. Acid Phosphate.. 16%.....	Biloxi Milling Co., Biloxi.....
11199	Stern's H. G. Acid Phosphate 16%.....	Barnes & Co., Columbia.....
11200	Stern's H. G. Acid Phosphate 16%.....	Hawkins & McRaney Co., Bassfield.... Average..... Guarantee.....
10147	Stern's H. G. Acid Phos. 14%.....	G. K. Evans & Co., Pachuta.....
10300	Stern's H. G. Acid Phos. 14%.....	The Rankin Co., Columbia.....
11201	Stern's H. G. Acid Phos. 14%.....	C. Atkinson's Sons Co., Summit.....
11202	Stern's H. G. Acid Phos. 14%.....	Johnson-Hand Co., Ellisville..... Average..... Guarantee.....
10301	S. G. Blood, Bone and Meat ..	E. M. Carter, Centreville.....
11203	S. G. Blood, Bone and Meat ..	D. C. Griffing & Co., Silver Creek..... Guarantee.....
10148	S. G. Boll Weevil Knockers	R. L. Berry & Bro., Prentiss.....
11204	S. G. Boll Weevil Knockers	E. J. Griffing, Hamburg..... Guarantee.....
10149	S. G. Champion Farmer's Choice	Rumble & Wensel Co., Natchez.....
10302	S. G. Champion Farmer's Choice	G. Lowenberg & Co., Kosciusko.....
11205	S. G. Champion Farmer's Choice	Clayton Ellis Co., Heidelberg..... Average..... Guarantee.....
10150	S. G. Miss. Home Guano	E. M. Carter, Centreville.....
11206	S. G. Miss. Home Guano	W. M. Hyde & Co., Poplarville.....
11207	S. G. Miss. Home Guano	J. L. & S. A. Bacot, Osyka.....
11208	S. G. Miss. Home Guano	Parker Bros. & Co., Sandersville..... Average..... Guarantee.....
9978	S. G. Stern's Am. R. B. Superphosphate	The Lampton Co., Columbia.....
10151	S. G. Stern's Am. R. B. Superphosphate	Hawkins-McRaney Co., Bassfield.....
10152	S. G. Stern's Am. R. B. Superphosphate	J. H. Williams & Sons, Prentiss.....
10303	S. G. Stern's Am. R. B. Superphosphate	The T. B. Bonner Co., Laurel.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10146	19.45	13.10	2.59	15.69	.73			17.00
10299	18.03	12.25	3.51	15.76	.96			16.99
11198	16.71	10.00	5.63	15.63	.79			16.63
11199	16.99	11.28	3.21	14.49	1.39			15.62
11200	15.64	10.13	4.48	14.61	1.27			15.62
	17.36	11.35	3.88	15.23	1.03			16.37
		<i>14.00</i>	<i>2.00</i>	<i>16.00</i>	<i>1.00</i>			<i>17.40</i>
10147	16.42	11.04	2.99	14.03	2.47			15.13
10300	17.28	11.21	3.77	14.98	1.46			16.10
11201	15.37	9.89	4.36	14.25	1.79			15.24
11202	16.20	10.20	4.88	15.08	1.36			16.10
	16.32	10.58	4.00	14.58	1.77			15.64
		<i>12.00</i>	<i>2.00</i>	<i>14.00</i>	<i>2.00</i>			<i>15.20</i>
10301	14.31	6.60	4.04	10.64	.79	1.93	1.50	21.33
11203	17.43	3.63	6.12	9.75	.77	1.69	1.50	19.15
		<i>7.00</i>	<i>2.50</i>	<i>9.50</i>	<i>1.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.06</i>
10148	14.89	6.19	4.35	10.54	1.15	2.22		20.54
11204	12.48	4.81	6.33	11.14	1.18	1.49		18.32
		<i>7.00</i>	<i>3.00</i>	<i>10.00</i>	<i>1.00</i>	<i>1.65</i>		<i>17.89</i>
10149	14.51	8.48	2.52	11.00	1.37	1.52	1.56	20.44
10302	12.12	7.78	2.76	10.54	1.27	1.65	1.53	20.32
11205	14.90	4.87	5.32	10.19	.75	1.52	1.49	19.11
	13.84	7.05	3.53	10.58	1.13	1.56	1.53	19.96
		<i>7.00</i>	<i>2.50</i>	<i>9.50</i>	<i>1.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.06</i>
10150	14.57	8.03	2.75	10.78	1.41	1.65	1.90	21.03
11206	15.65	7.34	2.85	10.19	.99	1.60	1.58	19.76
11207	12.96	5.00	5.69	10.69	.83	1.58	1.51	19.92
11208	12.72	6.09	4.35	10.44	.81	1.69	1.72	20.41
	13.97	6.61	3.91	10.52	1.01	1.63	1.68	20.28
		<i>7.00</i>	<i>2.50</i>	<i>9.50</i>	<i>1.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.06</i>
9978	14.90	5.88	4.38	10.26	1.27	1.67	1.66	20.05
10151	16.45	3.98	5.60	9.58	1.07	1.74	1.73	19.45
10152	16.96	4.59	5.61	10.20	1.02	1.77	1.87	20.47
10303	13.47	4.91	4.97	9.88	1.28	1.73	1.54	19.62

TABLE V.—Analyses of Commercial Fertilizer

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10304	S. G. Stern's Am. R. B. Superphosphate	E. W. Troutman, Long Beach.....
10305	S. G. Stern's Am. R. B. Superphosphate	Biloxi Milling Co., Biloxi.....
11209	S. G. Stern's Am. R. B. Superphosphate	Weatherbee-Huggins Co., Waynesboro
11210	S. G. Stern's Am. R. B. Superphosphate	Lampton Merc. Co., Magnolia.....
11211	S. G. Stern's Am. R. B. Superphosphate	John McGrath & Sons, Brookhaven....
11212	S. G. Stern's Am. R. B. Superphosphate	W. C. Ellis Co., Magee.....
11213	S. G. Stern's Am. R. B. Superphosphate	Lampton Bros. Co., Tylertown.....
		Average
		Guarantee.....
	SWIFT FERTILIZER WORKS, Atlanta, Ga.	
11214	Swift's Golden Harvest S. G. Guano	Planters Merc. Co., Baldwin.....
		Guarantee.....
11215	Swift's Monarch H. G. Guano..	Weatherbee-Huggins Co., Waynesboro
		Guarantee.....
11216	Swift's Red Steer S. G. Guano	J. P. Synott, Lodi
		Guarantee.....
	TENNESSEE CHEMICAL COMPANY Nashville, Tenn.	
11217	Ox H. G. Dissolved Bone 14%	G. D. McKellar, New Hope.....
		Guarantee.....
11218	Ox S. G. Slaughter House Bone	G. D. McKellar, New Hope.....
		Guarantee.....
	TENNESSEE VALLEY FERT. CO., Florence, Ala.	
11219	Tiger H. G. Dissolved Bone 16%.....	F. H. Matthews, Baldwin.....
		Guarantee.....
10306	H. G. Dissolved Bone 14%	W. A. Gunn, Noxapater.....
		Guarantee.....
10307	S. G. King Cotton Grower	Landrum & Bailey, Mathiston.....
11220	S. G. King Cotton Grower	J. J. Rogers & Sons, Tupelo.....
11221	S. G. King Cotton Grower	Farmers Union, Iuka.....
11222	S. G. King Cotton Grower	Union County Farmers Warehouse, New Albany.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10304	14.18	4.06	5.73	9.79	1.37	1.82	1.51	19.74
10305	13.23	4.44	5.66	10.10	1.09	1.77	1.50	19.92
11209	14.99	5.25	5.06	10.31	1.34	1.84	1.36	20.33
11210	16.34	4.53	5.97	10.50	.87	1.65	1.35	19.74
11211	15.48	3.79	5.97	9.76	.97	1.74	1.50	19.37
11212	15.78	5.50	4.73	10.23	1.23	1.75	1.52	20.11
11213	15.16	5.51	4.92	10.43	1.65	1.82	1.29	20.33
	15.18	4.77	5.33	10.10	1.19	1.75	1.53	19.92
		<i>7.00</i>	<i>2.50</i>	<i>9.50</i>	<i>1.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.06</i>
11214	10.45	4.80	4.95	9.75	.38	1.17	1.50	17.32
		<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>1.50</i>	<i>1.65</i>	<i>2.00</i>	<i>17.84</i>
		5.03	4.14	9.17	1.77	2.58	2.86	23.55
11215	9.70	<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>1.50</i>	<i>3.29</i>	<i>4.00</i>	<i>26.29</i>
		4.07	4.35	8.42	.46	1.69	1.92	18.21
		<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>1.50</i>	<i>1.65</i>	<i>2.00</i>	<i>17.84</i>
11216	9.59	4.07	4.35	8.42	.46	1.69	1.92	18.21
		<i>5.50</i>	<i>2.50</i>	<i>8.00</i>	<i>1.50</i>	<i>1.65</i>	<i>2.00</i>	<i>17.84</i>
11217	14.73	10.41	3.95	14.36	1.47			15.40
		<i>8.00</i>	<i>6.00</i>	<i>14.00</i>	<i>1.00</i>			<i>14.80</i>
		6.58	3.04	9.62	1.54	1.22	2.24	18.39
11218	11.83	<i>6.00</i>	<i>2.00</i>	<i>8.00</i>	<i>1.00</i>	<i>1.65</i>	<i>2.00</i>	<i>18.89</i>
11219	13.29	7.96	7.45	15.41	1.41			16.21
		<i>12.00</i>	<i>4.00</i>	<i>16.00</i>	<i>2.00</i>			<i>17.20</i>
		9.12	3.01	12.13	5.11			13.04
10306	13.83	<i>12.00</i>	<i>2.00</i>	<i>14.00</i>	<i>2.00</i>			<i>15.20</i>
10307	14.27	7.91	2.03	9.94	1.50	1.02	1.43	17.19
11220	13.50	7.46	4.03	11.49	5.07	.59	.48	16.15
11221	13.17	7.78	2.81	10.59	3.01	1.18	.74	17.70
11222	16.06	7.28	2.83	10.11	1.51	1.29	1.53	18.45
		7.61	2.92	10.53	2.77	1.02	1.05	17.37
		<i>7.00</i>	<i>2.00</i>	<i>9.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.00</i>	<i>17.94</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
THREEFOOT BROS. & COMPANY, Meridian, Miss.		
10075	Threefoot's H. G. English Acid Phosphate	Threefoot Bros. & Co., Meridian.....
11223	Threefoot's H. G. English Acid Phosphate	J. R. Elerbee, Lauderdale..... Guarantee.....
9879	Threefoot's H. G. Improved Mixture	Threefoot Bros. & Co., Meridian.....
11224	Threefoot's H. G. Improved Mixture	Simmons & Wright, Keewanee..... Guarantee.....
TUPELO FERTILIZER FACTORY, Tupelo, Miss.		
11225	Cotton Belt H. G. Acid Phosphate 16%	Baldwyn Supply Co., Baldwyn..... Guarantee.....
9908	H. G. Cotton Belt Acid Phosphate 14%	A. Dewesse, Philadelphia.....
9909	H. G. Cotton Belt Acid Phosphate 14%	J. D. Shaw, Louisville.....
10308	H. G. Cotton Belt Acid Phosphate 14%	Gilmore & May Co., Amory.....
11226	H. G. Cotton Belt Acid Phosphate 14%	A. W. Allen, Tupelo..... Average
		Guarantee.....
10309	H. G. Levi Phillip's Acid Phosphate	Phillips, Reinhart, Taylor Co., B'ville Guarantee.....
11227	S. G. Cotton Belt Blood & Bone	J. R. Clayton, Guntown.....
11228	S. G. Cotton Belt Blood & Bone	Baldwyn Supply Co., Baldwyn..... Guarantee.....
9910	S. G. Cotton Belt Fertilizer	J. D. Shaw, Louisville.....
9911	S. G. Cotton Belt Fertilizer	A. Dewesse, Philadelphia.....
10310	S. G. Cotton Belt Fertilizer	Lann & Carter, Aberdeen.....
11229	S. G. Cotton Belt Fertilizer	J. D. Furtick, Rienzi.....
11230	S. G. Cotton Belt Fertilizer	C. T. Bonney, Enterprise..... Average
		Guarantee.....
10311	S. G. Levi Phillips' Mixture	Phillips, Reinhart, Taylor Co., B'ville Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10075	14.68	11.31	3.70	15.01	2.15			16.14
11223	11.92	9.95 13.00	7.23 2.00	17.18 15.00	.50 1.00			18.18 16.30
9879	13.01	8.76	2.71	11.47	1.62	1.77	1.87	22.28
11224	14.94	7.30 7.50	4.32 2.50	11.62 10.00	.86 1.00	1.74 1.67	2.01 2.00	22.35 20.31
11225	15.70	9.80 13.00	4.85 3.00	14.65 16.00	1.19 1.00			15.63 17.30
9908	15.60	11.59	3.34	14.93	1.38			16.09
9909	15.55	11.85	3.14	14.99	1.16			16.18
10308	13.54	10.95	4.04	14.99	1.93			16.09
11226	14.99 14.92	10.78 11.29 12.00	4.26 3.70 2.00	15.04 14.99 14.00	1.62 1.52 2.00			16.12 16.12 15.20
10309	14.29	12.15 12.00	2.28 2.00	14.43 14.00	1.91 2.00			15.65 15.20
11227	14.74	6.52	5.82	12.34	.50	1.12	1.25	19.86
11228	15.26	5.88 8.00	5.69 2.00	11.57 10.00	1.00 1.00	1.00 1.65	1.24 1.50	18.49 19.71
9910	14.44	7.86	3.17	11.03	.87	1.54	1.39	20.29
9911	12.97	7.71	2.93	10.64	1.05	1.64	1.35	20.18
10310	11.79	7.69	2.99	10.68	1.38	1.82	1.50	21.07
11229	16.60	9.25	3.60	12.85	.33	1.83	1.54	23.69
11230	13.09	7.42	3.94	11.36	.95	1.66	1.43	21.11
	13.78	7.99 8.00	3.32 2.00	11.31 10.00	.92 1.00	1.70 1.65	1.44 1.50	21.27 19.71
10311	12.65	8.75 8.00	2.40 2.00	11.15 10.00	1.32 1.00	1.53 1.65	1.49 1.50	20.59 19.71

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	VIRGINIA-CAROLINA CHEMICAL COMPANY, Memphis, Tenn.	
10076	S. G. I. X. L. Acid Phosphate	Henderson-Molphus Co., Philadelphia
10153	S. G. I. X. L. Acid Phosphate	McLean & Ratcliff, Gloster.....
10312	S. G. I. X. L. Acid Phosphate	Joe Shelby, Hattiesburg.....
11231	S. G. I. X. L. Acid Phosphate	R. W. Fagan & Co., Waynesboro.....
		Average
		Guarantee.....
10313	S. G. Royal Acid Phosphate ..	J. Niles Boyd, Ethel.....
11232	S. G. Royal Acid Phosphate ..	Bennett Bros., Louisville.....
		Guarantee.....
9979	Scott's H. G. Acid Phosphate	Winner-Klein Co., Meridian.....
10077	Scott's H. G. Acid Phosphate	Donald Bros., Newhebron.....
10314	Scott's H. G. Acid Phosphate	Lann & Carter, Aberdeen.....
11233	Scott's H. G. Acid Phosphate	C. C. Fancher, McCool.....
11234	Scott's H. G. Acid Phosphate	Winner-Klein Co., Meridian.....
		Average
		Guarantee.....
10154	H. G. V. C. Superphos. 16%....	McLean & Rudder Co., Bassfield.....
10315	H. G. V. C. Superphos. 16%....	T. S. Turner, Canton.....
11235	H. G. V. C. Superphos. 16%....	W. C. Ellis & Co., Magee.....
11236	H. G. V. C. Superphos. 16%....	M. H. Rothschilds, Woodville.....
11237	H. G. V. C. Superphos. 16%....	Osyka Merc. Co., Osyka.....
11238	H. G. V. C. Superphos. 16%....	Mutual Merc. Co., Utica.....
		Average
		Guarantee.....
9980	S. G. Mobile Double Eagle Guano	Meyer Bros., Meridian
10078	S. G. Mobile Double Eagle Guano	Mars Bros., Philadelphia.....
10155	S. G. Mobile Double Eagle Guano	McLean & Rudder Co., Bassfield.....
10316	S. G. Mobile Double Eagle Guano	J. J. Prince & Co., Shuqualak.....
11239	S. G. Mobile Double Eagle Guano	Ruffin Merc. Co., Ellisville.....
11240	S. G. Mobile Double Eagle Guano	Planters Merc. Co., Woodville.....
11241	S. G. Mobile Double Eagle Guano	Wiggins & Hardee, Eupora.....
11242	S. G. Mobile Double Eagle Guano	T. J. Cole & Co., Ripley
11243	S. G. Mobile Double Eagle Guano	Harrison & Nelson Co., Magee.....
11244	S. G. Mobile Double Eagle Guano	Green & Stuckey Co., Amory.....
		Average
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10076	10.62	9.36	3.77	13.13	.43			14.07
10153	11.51	9.30	4.12	13.42	.72			14.35
10312	10.41	9.74	3.45	13.19	1.47			14.16
11231	9.02	6.74	6.12	12.86	1.41			13.53
	10.39	8.78	4.37	13.15	1.01			14.03
		<i>8.50</i>	<i>3.50</i>	<i>12.00</i>	<i>2.00</i>			<i>12.85</i>
10313	13.30	9.79	2.53	12.32	.77			13.30
11232	14.01	8.39	3.04	11.43	1.28			12.27
		<i>8.50</i>	<i>3.50</i>	<i>12.00</i>	<i>2.00</i>			<i>12.85</i>
9979	14.07	11.23	3.36	14.59	1.06			15.71
10077	14.73	10.77	3.62	14.39	.73			15.47
10314	13.32	9.95	3.04	12.99	1.25			13.99
11233	11.62	11.55	3.94	15.49	.10			16.65
11234	12.02	8.72	6.13	14.85	1.06			15.72
	13.15	10.44	4.02	14.46	.84			15.51
		<i>10.00</i>	<i>4.00</i>	<i>14.00</i>	<i>2.00</i>			<i>15.00</i>
10154	12.44	13.14	3.37	16.51	1.09			17.82
10315	10.67	14.65	3.18	17.83	1.19			19.30
11235	12.56	10.40	4.81	15.21	1.15			16.25
11236	12.40	12.33	4.53	16.86	.09			18.09
11237	13.30	8.69	7.27	15.96	.62			16.83
11238	12.76	9.95	6.31	16.26	.69			17.26
	12.35	11.53	4.91	16.44	.81			17.59
		<i>11.50</i>	<i>4.50</i>	<i>16.00</i>	<i>2.00</i>			<i>17.15</i>
9980	12.12	7.41	2.98	10.39	1.69	1.59	1.44	19.79
10078	12.99	8.10	2.84	10.94	1.70	1.48	1.75	20.41
10155	11.54	7.50	3.17	10.67	1.37	1.58	1.82	20.51
10316	13.37	7.62	2.67	10.29	1.79	1.68	1.65	20.28
11239	12.07	6.54	3.51	10.05	.61	1.47	1.51	18.96
11240	14.08	6.50	3.49	9.99	1.51	1.47	1.22	18.55
11241	12.51	6.03	3.86	9.89	.38	1.67	1.14	19.06
11242	13.48	7.77	2.64	10.41	.67	1.65	1.57	20.22
11243	11.48	6.31	4.77	11.08	.68	1.53	1.60	20.40
11244	12.37	7.74	3.21	10.95	.84	1.28	.97	18.73
	12.60	7.15	3.31	10.46	1.12	1.54	1.47	19.69
		<i>7.00</i>	<i>3.00</i>	<i>10.00</i>	<i>2.00</i>	<i>1.65</i>	<i>1.50</i>	<i>19.61</i>

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10393	S. G. Mobile R. B. Ammoniated Superphosphate ..	Hartman Merc. Co., Brookhaven.....
11245	S. G. Mobile R. B. Ammoniated Superphosphate ..	W. H. Patton, Shubuta..... Guarantee.....
10156	S. G. Mobile Standard Guano	Mars Bros., Philadelphia.....
11246	S. G. Mobile Standard Guano	W. W. Harris & Co., Iuka..... Guarantee.....
10157	H. G. Muriate of Potash	Weatherbee-Huggins Co., Waynesboro
10317	H. G. Muriate of Potash	Pinehurst Fruit & Nut Plantation, State Line..... Guarantee.....
10318	S. G. Royal Blood, Bone & Potash.....	Wood & Harpole Co., Eupora.....
11247	S. G. Royal Blood, Bone & Potash.....	Smythe, Gaddis & Co., Forest.....
11248	S. G. Royal Blood, Bone & Potash.....	Hyman Merc. Co., Summit..... Average..... Guarantee.....
10319	H. G. Royal Vegetable Fert.	Biloxi Milling Co., Biloxi.....
11249	H. G. Royal Vegetable Fert.....	Biloxi Milling Co., Biloxi..... Guarantee.....
9981	S. G. Scott's Gossypium Phospho	Winner-Klein Co., Meridian.....
10079	S. G. Scott's Gossypium Phospho	Donald Bros., New Hebron.....
10158	S. G. Scott's Gossypium Phospho	Weatherbee-Huggins Co., Waynesboro
10320	S. G. Scott's Gossypium Phospho	C. C. Fancher, McCool.....
10321	S. G. Scott's Gossypium Phospho	Sid Welch Shuqualak.....
10322	S. G. Scott's Gossypium Phospho	O. Hopkins, Hickory.....
10511	S. G. Scott's Gossypium Phospho	Weatherbee-Huggins Co., Waynesboro
10843	S. G. Scott's Gossypium Phospho	O. D. Lee, Vossburg.....
10844	S. G. Scott's Gossypium Phospho	O. D. Lee, Vossburg.....
11250	S. G. Scott's Gossypium Phospho	Lann & Carter, Aberdeen.....
11251	S. G. Scott's Gossypium Phospho	Johnson-Hand Co., Ellisville.....
11252	S. G. Scott's Gossypium Phospho	Crawford & Coleman, Noxapater.....
11253	S. G. Scott's Gossypium Phospho	J. L. Shinault, Oxford.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10393	12.87	8.29	3.27	11.56	1.34	1.33	1.78	20.58
11245	13.75	7.15 7.00	3.90 3.00	11.05 10.00	1.02 2.00	1.52 1.65	1.14 1.50	19.88 19.61
10156	11.72	6.58	3.29	9.87	1.42	1.77	1.63	20.03
11246	12.18	6.23 6.00	4.30 2.50	10.53 8.50	1.24 2.00	1.41 1.65	1.92 2.00	19.70 18.44
10157	2.99						49.00	56.35
10317	2.93						46.80 49.00	53.82 56.35
10318	10.54	7.11	3.86	10.97	.77	1.54	1.67	20.47
11247	12.69	7.13	6.21	13.34	.97	1.20	1.55	21.67
11248	10.48 11.23	8.30 7.51 7.00	5.01 5.03 3.00	13.31 12.54 10.00	1.45 1.06 2.00	1.35 1.36 1.65	.83 1.35 1.50	21.49 21.21 19.61
10319	11.82	6.23	2.45	8.68	1.27	1.96	3.46	21.50
11249	9.67	5.25 6.00	3.64 2.00	8.89 8.00	.77 2.00	2.17 2.47	3.00 4.00	21.89 23.26
9981	12.54	9.34	2.26	11.60	.86	1.30	1.73	20.56
10079	13.43	6.75	3.31	10.06	1.48	1.63	1.88	20.02
10158	13.49	7.45	2.38	9.83	.75	1.36	1.55	18.44
10320	10.77	7.00	3.78	10.78	1.02	1.54	1.85	20.46
10321	11.06	8.87	2.83	11.70	.92	1.68	1.51	21.79
10322	9.95	7.05	4.03	11.08	1.05	1.47	1.73	20.40
10511	11.41	6.40	3.41	9.81	.86	1.75	1.87	20.14
10843	12.03	6.98	2.78	9.76	1.58	1.88	1.54	20.56
10844	7.76	6.81	3.18	9.99	3.19	2.15	1.01	20.89
11250	13.93	7.37	1.97	9.34	1.16	1.57	1.51	18.64
11251	11.72	6.92	3.13	10.05	.95	1.39	1.20	18.34
11252	12.52	6.70	4.44	11.14	.96	1.59	1.34	20.43
11253	13.48	8.21	2.73	10.94	1.41	1.52	1.54	20.33

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11254	S. G. Scott's Gossypium Phospho	Riverside Commercial Co., Leaf.....
		Average
		Guarantee.....
11255	S. G. V. C. C. Standard Guano	McLain & Tatum, Gloster.....
11256	S. G. V. C. C. Standard Guano	McCullar & Co., Booneville.....
		Guarantee.....
11257	S. G. German Kainit	W. W. Harris & Co., Iuka.....
11258	S. G. German Kainit	F. H. Deas, Enterprise.....
		Guarantee.....
	WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss.	
11259	H. G. Acid Phosphate	Wesson Cotton Oil & Fert. Co., Wesson
11260	H. G. Acid Phosphate	Wesson Cotton Oil & Fert. Co., Wesson
		Guarantee.....
10323	S. G. Mutual Friend Mixture ..	J. F. Armstrong, Sontag.....
11261	S. G. Mutual Friend Mixture ..	Wesson Cotton Oil & Fert Co., Wesson
		Guarantee.....

Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
		Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
11254	12.79	5.98	4.06	10.04	1.44	1.32	1.25	18.03
	11.78	7.27	3.17	10.44	1.26	1.58	1.54	19.93
		7.00	3.00	10.00	2.00	1.65	1.50	19.61
11255	11.64	5.75	4.39	10.14	3.69	1.53	1.12	18.75
11256	13.89	7.54	2.88	10.42	.84	1.62	1.59	20.12
		7.00	3.00	10.00	2.00	1.65	1.50	19.61
11257	6.63						12.22	14.05
11258	6.56						12.00	13.80
							12.00	13.80
11259	14.40	7.27	6.48	13.75	.82			14.48
11260	12.98	8.53	5.49	14.02	.40			14.87
		12.00	2.00	14.00	1.00			15.20
10323	11.18	7.18	2.72	9.90	.54	1.50	1.86	19.37
11261	10.97	5.79	4.23	10.02	.96	1.64	1.28	19.22
		7.00	2.00	9.00	1.00	1.65	1.75	18.80

10099	Shield Brand S. G. Superphosphate and Potash Guarantee	10099	10.99	5.51	3.98	9.49	.82	1.58	\$12.81
10101	Armour's H. G. Dried Blood	10101	10.10			10.00	1.00	2.00	14.10
10851	Shield Brand H. G. Fertilizer No. 857 Guarantee	10851	5.83	7.94	.67	8.61	.91	7.00	50.63
10100	Shield Brand S. G. King Cotton Guarantee	10100	7.63	4.62	2.35	6.97	.63	7.00	31.14
10102	Shield Brand H. G. Vegetable Fertilizer Guarantee	10102	6.07	3.80	2.23	6.03	1.46	1.56	32.90
10103	S. G. German Kainit Guarantee	10103	2.78	4.00	2.00	6.00	1.00	2.00	15.25
								4.87	17.89
								5.00	20.94
								12.54	22.01
								12.00	22.01
								14.42	22.01
								13.80	22.01
10088	Castor Pomace	10088	8.05				2.02	.64	23.68
							1.50	.50	18.20
10217	Monarch Extra H. G. Acid Phosphate Birmingham, Ala.	10217	13.64	15.59	1.95	17.54	23		19.10
9746	Birmingham H. G. Acid Phosphate Guarantee	9746	14.29	14.00	2.00	16.00	2.00		17.40
9747	Monarch H. G. Acid Phosphate Guarantee	9747	13.83	11.01	3.74	14.75	.86		15.85
9748	Birmingham H. G. Fertilizer Guarantee	9748	12.10	12.00	2.00	14.00	2.00		15.20
9749	Birmingham S. G. Fertilizer Guarantee	9749	10.75	12.00	3.77	14.54	.86		15.62
10219	Monarch S. G. Blood and Bone Guano Guarantee	10219	10.10	12.00	2.00	14.00	2.00		15.20
9750	Monarch S. G. Meal Mixture Guarantee	9750	10.51	7.51	2.93	10.44	.72	2.19	20.42
10220	Birmingham S. G. German Kainit Guarantee	10220	1.75	8.00	2.00	10.00	2.00	2.00	20.29
				6.82	2.95	9.77	.86	1.84	20.26
				6.00	2.00	8.00	2.00	2.00	17.89
				8.80	3.07	11.87	1.28	1.63	21.59
				7.50	2.00	9.50	2.00	1.50	19.11
				7.18	3.12	10.30	1.36	1.88	21.07
				7.50	2.00	9.50	2.00	1.50	19.11
								13.68	15.73
								12.00	13.80

W. H. BARRON & COMPANY,
Crystal Springs, Miss.

BIRMINGHAM FERTILIZER COMPANY,
Birmingham, Ala.

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.										
12097	H. G. Acid Phosphate	12097	12.86	10.26	5.00	15.26	.91			\$16.29
	Guarantee			12.00	2.00	14.00	2.00			15.20
12098	Brookhaven S. G. Blood and Bone	12098	11.66	5.26	4.51	9.77	1.45	1.52	1.97	19.24
	Guarantee			6.25	3.00	9.25	1.00	1.65	1.75	19.00
12099	Brookhaven H. G. Truck Grower	12099	8.28	3.52	2.85	6.37	.32	3.04	3.62	22.92
	Guarantee			5.00	1.00	6.00	1.00	3.00	4.00	22.95
12100	H. G. Cotton Tail Meal and Acid Mixture	12100	11.02	7.73	3.27	11.00	.93	1.97	.66	21.02
	Guarantee			8.00	2.00	10.00	1.00	2.10	.55	20.31
12101	S. G. New South	12101	12.22	5.77	3.31	9.08	1.04	1.62	2.28	19.26
	*H. G. Half and Half Special Corn Fertilizer			6.00	3.00	9.00	1.00	1.70	2.00	19.18
	Guarantee			7.00	1.25	8.25	1.00	3.00	.75	21.89
	Guarantee									
CADDO FERTILIZER COMPANY, Shreveport, La.										
10012	Louisiana H. G. Acid Phosphate	10012	12.42	13.10	3.81	16.91	.75			18.22
	Guarantee			14.00	2.00	16.00	1.00			17.40
10013	Caddo H. G. Acid Phosphate	10013	17.54	10.00	5.04	15.04	.81			16.04
	Guarantee			12.00	2.00	14.00	1.00			15.20
10014	Caddo S. G. Cotton	10014	14.78	7.50	3.98	11.48	.63	1.92	1.87	22.73
	Guarantee			8.00	2.00	10.00	1.00	1.65	1.00	19.14
10015	Caddo S. G. Star	10015	14.78	7.59	3.70	11.29	.68	1.79	1.91	22.09
	Guarantee			8.00	2.00	10.00	1.00	1.65	1.50	19.71

* Official sample was not submitted for analysis

10016	S. G. Weevil Beater Guano Guarantee	10016	13.89	6.01	4.06	10.07	2.35	1.41	2.27	19.58
10017	Caddo H. G. Vegetable Guano Guarantee	10017	16.45	4.80	3.70	8.50	.58	3.13	1.50	19.71
	*Caddo S. G. Corn Fertilizer Guarantee			6.00	2.00	8.00	1.00	3.30	4.00	26.38
				4.00	2.00	6.00	1.00	2.85	1.00	18.84
CANTON OIL MILL COMPANY Canton, Miss.										
12102	H. G. Acid Phosphate Guarantee	12102	10.85	12.31	4.94	17.25	.64			\$18.48
12103	S. G. Paragon Guarantee	12103	8.60	8.38	4.50	12.88	.41	2.01	.55	23.18
	*S. G. German Kainit Guarantee			6.50	3.50	10.00	1.05	2.00	.50	19.73
									12.00	13.80
CAPITAL FERTILIZER & M'FG. COMPANY, Jackson, Miss.										
9792	H. G. Acid Phosphate Guarantee	9792	4.55	13.20	5.66	18.86	.88			20.18
9793	H. G. Acid Phosphate Guarantee	9793	5.88	10.54	5.43	15.97	.78			17.20
9794	S. G. Acid Phosphate Guarantee	9794	3.89	8.74	4.65	13.39	.69			17.02
9795	H. G. Bone Meal Guarantee	9795	1.98	10.00	2.00	12.00	1.00	2.78		15.00
							23.48			14.26
9796	S. G. Capital Blood, Bone and Potash Guarantee	9796	5.43	5.23	4.49	9.72	.78	2.50	2.03	13.00
10161	S. G. Capital Early Producer Guarantee	10161	11.74	6.50	2.50	9.00	1.00	2.50	2.00	22.17
9797	S. G. Cotton Elevator Guarantee	9797	6.53	8.00	3.42	11.42	.87	1.63	2.03	21.88
9798	H. G. Muriate of Potash Guarantee	9798	.30	6.64	3.00	9.50	1.00	2.67	2.00	19.66
10026	H. G. Nitrate of Soda Guarantee	10026	1.29	6.50	2.50	9.00	1.00	1.83	2.35	19.24
								1.65	2.35	24.24
									53.62	50.18
									2.00	19.04
									48.00	55.20
									15.24	57.15
									15.00	56.25

*Official sample was not submitted for analysis.

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9799	S. G. Nonparel	9799	7.20	6.63	3.85	10.48	.81	1.78	2.25	21.45
9800	Guarantee			6.50	2.50	9.00	1.00	1.65	2.00	19.04
9800	S. G. Red Star Brand	9800	7.78	6.63	3.70	10.33	.83	1.83	2.34	21.58
9801	Guarantee			6.50	2.50	9.00	1.00	1.65	2.00	19.04
9801	H. G. Sulphate of Ammonia	9801	.84					20.38		76.43
9802	Guarantee							20.00		75.00
9802	H. G. Sulphate of Potash	9802	1.38						50.40	57.96
9803	Guarantee								50.00	57.50
9803	H. G. Vegetable Grower	9803	7.40	5.01	3.23	8.24	.61	2.52	4.85	24.59
9804	Guarantee			6.00	2.00	8.00	1.00	2.25	4.00	22.44
9804	S. G. German Kainit	9804	6.17						14.00	16.10
	Guarantee								12.00	13.80
CRYSTAL SPRINGS OIL MILL, FERTILIZER & M'F'G. COMPANY, Crystal Springs, Miss.										
9917	H. G. Acid Phosphate	9917	8.22	11.45	4.69	16.14	1.42			17.29
	Guarantee			10.00	5.00	15.00	1.00			16.00
9926	S. G. Crystal Springs	9926	10.58	6.93	2.44	9.37	1.20	2.33	2.52	22.64
9918	Guarantee			6.50	2.50	9.00	1.00	1.70	1.90	19.11
9918	H. G. Crystal Vegetable Grower	9918	6.45	4.16	3.21	7.37	.54	3.50	5.57	28.05
	Guarantee			4.00	1.50	5.50	.25	3.00	4.00	22.30
9927	S. G. L. & H.'s Cofton Fertilizer	9927	10.01	6.72	2.80	9.52	1.10	2.18	2.33	22.00
	Guarantee			5.50	2.50	8.00	.75	1.70	2.00	18.03

10388	H. G. L. & H.'s Vegetable Grower. Guarantee	10388	5.98	4.26	2.63	6.89	.46	3.65	5.56	28.09
10389	S. G. German Kainit Guarantee	10389	7.79	4.00	1.50	5.50	.25	3.00	4.00	22.30
									13.14	15.11
									12.00	13.80
EAGLE COTTON OIL COMPANY, Meridian, Miss.										
10874	H. G. Acid Phosphate Guarantee	10874	10.26	11.22	3.17	14.39	1.29			15.51
10875	S. G. Farm Mixture Guarantee	10875	10.05	7.29	2.24	9.53	.29	1.83	2.18	20.58
10876	S. G. German Kainit Guarantee	10876	4.33	6.00	2.00	8.00	.50	1.65	2.00	17.89
									12.66	14.56
									12.00	13.80
FEDERAL CHEMICAL COMPANY, Louisville, Ky.										
10108	Daybreak H. G. Acid Phosphate Guarantee	10108	13.18	10.59	6.38	16.97	.45			18.03
10109	Daybreak H. G. Acid Phosphate Guarantee	10109	11.74	9.67	5.33	16.00	1.00			17.07
10110	Daybreak S. G. Bone and Potash Guarantee	10110	10.12	5.78	4.00	14.00	1.00			17.43
10111	Daybreak S. G. Early Bell Fertilizer Guarantee	10111	8.62	6.63	4.63	11.26	1.38	1.76	2.78	17.51
10112	Daybreak H. G. Fertilizer Guarantee	10112	9.66	6.67	3.33	10.00	1.06	1.65	1.83	21.75
10113	Daybreak S. G. Red Rooster Guarantee	10113	11.35	6.98	4.97	11.95	1.23	1.98	2.41	23.93
				6.67	3.33	10.00	1.00	1.65	2.00	20.15
				6.67	3.33	10.00	1.00	1.92	3.20	24.72
								1.65	1.50	19.58
FLORENCE COTTON OIL COMPANY, Florence, Ala.										
10172	Liberty H. G. Dissolved Bone Guarantee	10172	11.24	9.47	2.59	12.06	2.72			13.01
10173	Liberty S. G. Dissolved Bone Guarantee	10173	11.10	8.98	2.61	11.59	3.10			15.20
10872	S. G. Liberty Blood and Bone Guarantee	10872	4.69	7.78	4.35	12.13	5.94	1.52	1.29	21.30
				8.00	2.00	10.00	2.00	1.65	1.50	19.71

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.					Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.				
10174	S. G. Cottonseed Meal and Bone Guarantee	10174	7.55	6.65	1.28	10.47	1.25	1.47	4.45	23.01	17.89
10175	Liberty S. G. Potash Guano Guarantee	10175	9.02	8.85	3.61	12.46	2.00	1.65	3.51	18.39	14.10
10176	Liberty H. G. Special Guarantee	10176	8.97	6.56	3.03	9.59	2.99	1.28	3.62	20.17	20.29
10177	S. G. German Kainit Guarantee	10177	5.99	8.00	2.00	10.00	2.00	1.65	12.90	14.84	13.80
A. H. GEORGE & COMPANY, Meridian, Miss.											
10852	H. G. Acid Phosphate Guarantee	10852	9.55	9.43	4.53	13.96	1.57			14.90	15.20
9461	S. G. Acid Phosphate Guarantee	9461	16.64	7.75	6.64	14.39	1.14			15.17	13.00
9462	George's S. G. Cotton King Guarantee	9462	8.33	4.12	3.81	7.93	1.64	1.95	2.33	19.13	19.73
10355	George's Potato and Vegetable Grower Guarantee	10355	6.66	6.33	3.37	9.70	.81	2.22	2.04	21.97	26.50
GRASSELLI CHEMICAL COMPANY, Birmingham, Ala.											
10340	Grasselli's H. G. Blood Meal Mixture Guarantee	10340	3.42	7.10	2.76	9.86	.24	2.30	2.46	23.01	20.19
10836	Grasselli's H. G. Fertilizer Guarantee	10836	13.72	6.95	3.53	10.48	1.04	2.40	2.56	24.17	20.19

GREAT SOUTHERN PHOSPHATE COMPANY, Mt. Pleasant, Tenn.									
9768	H. G. Great Southern Special Acid Phosphate Guarantee	9768	12.23	11.59	4.03	15.62	1.83	4.00	16.78
9769	H. G. Great Southern Acid Phosphate Guarantee	9769	14.05	10.09	3.95	14.04	1.27	2.00	17.40
9770	H. G. Best by Test Guarantee	9770	7.73	5.44	5.24	10.68	4.99	2.00	15.05
9771	S. G. Ever Ready Guarantee	9771	7.07	7.00	3.00	10.00	5.00	1.65	15.20
9772	S. G. Farmer's Favorite Guarantee	9772	9.46	5.82	4.76	10.58	3.81	2.00	20.95
9773	H. G. General Lee Cotton Grower Guarantee	9773	9.32	8.56	3.73	12.29	2.24	1.65	20.19
9774	O. G. Planters Champion Guarantee	9774	7.73	4.94	6.08	11.02	7.00	1.65	20.19
9775	S. G. Universal Cotton Grower Guarantee	9775	7.44	2.20	6.54	8.74	8.92	1.73	17.89
12104	S. G. German Kainit Guarantee	12104	3.93	6.00	2.00	8.00	5.00	1.65	17.89
	* H. G. Bass Special Guarantee			4.00	2.00	6.00	4.00	3.72	12.00
	* H. G. Great Southern Big Success Guarantee			8.00	4.00	12.00	2.00	1.65	20.95
	* H. G. Great Southern Truck Grower's Choice Guarantee			5.00	2.00	7.00	4.00	2.46	20.19
	* S. G. Superior Cotton Grower Guarantee			8.00	2.00	10.00	2.00	2.47	24.33
	* H. G. Muriate of Potash Guarantee								21.06
	* H. G. Nitrate of Soda Guarantee								50.00
									57.50
									56.25
GULFPORT COTTON OIL, FERTILIZER & M'F'G. COMPANY, Gulfport, Miss.									
9480	Primo H. G. Acid Phosphate Guarantee	9480	10.35	11.18	5.37	16.55	.64		17.67
				14.00	2.00	16.00	1.00		17.40

* Official sample was not submitted for analysis.

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9481	Primo H. G. Acid Phosphate Guarantee	9481	13.28	9.05	3.96	13.01	1.22			13.92
9482	Primo S. G. Acid Phosphate Guarantee	9482	9.69	7.46	6.34	13.80	.59			15.20
9483	Primo S. G. Acid Phosphate and Potash Guarantee	9483	10.34	6.80	4.22	12.82	.27		3.64	19.15
9484	Primo H. G. Blood and Bone Guarantee	9484	12.55	9.00	3.50	10.57	1.50		2.76	23.23
9485	Primo S. G. Cotton and Corn Guarantee	9485	12.50	8.00	2.00	10.00	1.00		2.00	20.29
9486	Primo S. G. Cottonseed Meal Compound Guarantee	9486	11.10	6.54	2.93	9.47	.81		2.46	21.55
9487	Primo H. G. Cottonseed Meal Mixture Guarantee	9487	11.49	6.90	2.91	9.81	.98		2.00	19.09
9812	Primo S. G. Fretich's Special Compound Guarantee	9812	9.47	8.10	3.65	11.75	.13		2.33	21.44
10214	Primo H. G. Fruit Tree Extra Guarantee	10214	3.85	5.67	1.73	7.40	1.32		1.50	20.67
9488	Primo H. G. Nitrate of Soda Guarantee	9488	2.11	5.00	1.00	6.00	1.00		8.00	25.66
9489	Primo H. G. Raw Ground Bone Guarantee	9489	5.31				25.88			55.50
9490	Primo S. G. Raw Bone Superphosphate Guarantee	9490	9.29	6.90	2.75	9.65	1.04		2.58	20.57
				7.00	2.00	9.00	1.00		2.00	19.09

10216	Primo S. G. Special Aurora Guarantee	10216	6.38	8.11	3.64	11.75	1.85	1.70	20.11
10215	Primo S. G. Special Eclipse Guarantee	10215	7.27	7.37	3.60	10.97	2.06	2.38	17.99
9491	Primo H. G. Vegetable Grower Guarantee	9491	9.61	3.98	2.34	6.32	.41	2.59	21.73
9492	Primo S. G. German Kaint Guarantee	9492	1.17	5.00	1.00	6.00	1.00	2.47	19.30
									6.47
									5.00
									13.04
									12.00
									13.80
HAZLEHURST OIL MILL & FERTILIZER COMPANY, Hazlehurst, Miss.									
9450	H. G. Acid Phosphate Guarantee	9450	13.41	13.07	3.33	16.40	.84		17.71
9451	S. G. Imperial Fertilizer Guarantee	9451	11.82	7.64	3.70	11.34	.35	1.52	15.20
9452	H. G. Imperial Vegetable Grower Guarantee	9452	9.14	7.00	2.00	9.00	1.00	1.65	21.27
9453	S. G. German Kaint Guarantee	9453	4.49	5.05	2.78	7.83	.20	1.65	18.80
				4.50	2.50	7.00	1.00	2.92	23.15
								2.50	20.40
								13.08	15.04
								12.00	13.80
INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss.									
12105	H. G. All Lint Fertilizer Guarantee	12105	13.00	9.59	2.18	11.77	.63	1.44	20.94
				8.00	2.00	10.00	1.00	1.65	20.29
JACKSON FERTILIZER COMPANY, Jackson, Miss.									
9734	H. G. Acid Phosphate Guarantee	9734	13.24	13.91	2.21	16.12	1.62		17.51
9735	H. G. Acid Phosphate Guarantee	9735	8.71	13.00	3.00	16.00	1.00		17.50
9736	S. G. Black Hawk Acid Phosphate Guarantee	9736	12.22	11.41	2.93	14.34	2.46		15.48
				12.00	2.00	14.00	1.00		15.20
9737	H. G. Bone Meal Guarantee	9737	3.21	12.31	1.90	14.21	1.80		15.44
				10.00	2.00	12.00	1.00		13.00
							26.90	2.28	22.00
9738	S. G. Chicago R. B. Superphosphate Guarantee	9738	9.68	6.70	4.29	10.99	22.90	2.47	20.71
				7.50	2.00	9.50	1.66	2.01	22.09
							1.00	1.65	19.11

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.					Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.				
10041	S. G. Early Dixie	10041	9.98	8.01	2.60	10.61	5.09	2.04	.48	20.67	
	Guarantee			8.00	2.00	10.00	1.00	2.00	.30	19.65	
9835	H. G. Fruit and Vegetable Fertilizer	9835	10.90	5.42	1.72	7.14	1.00	3.50	4.01	26.13	
	Guarantee			3.00	3.00	6.00	1.00	3.00	4.00	22.75	
9836	S. G. Gulf States Guano	9836	12.58	7.70	2.62	10.32	1.47	1.75	2.12	21.12	
	Guarantee			7.00	2.00	9.00	1.00	1.65	1.80	18.86	
9837	H. G. Huber's Veribest	9837	11.42	6.19	2.92	9.11	1.37	3.27	2.91	26.25	
	Guarantee			5.50	2.00	7.50	1.00	3.85	3.00	26.69	
9739	S. G. Lampton's R. B. Superphosphate	9739	9.62	6.88	4.01	10.89	1.73	2.14	1.32	22.21	
	Guarantee			7.50	2.00	9.50	1.00	1.65	1.50	19.11	
10344	S. G. New Era Acid and Meal Mixture	10344	9.55	6.52	4.78	11.30	5.88	1.84	.40	20.44	
	Guarantee			8.00	2.00	10.00	1.00	1.65	.35	18.39	
9740	H. G. Nitrate of Soda	9740	2.53					14.80		55.50	
	Guarantee							15.00		56.25	
9741	S. G. Royal "C" Brand	9741	12.74	7.87	2.78	10.65	1.51	1.68	1.80	20.87	
	Guarantee			7.00	2.50	9.50	1.00	1.65	1.80	19.41	
9742	S. G. German Kainit	9742	3.44							13.80	
	Guarantee								12.00	13.80	
JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.											
10533	Warrior H. G. English Acid Phosphate	10533	8.49	11.92	2.74	14.66	.43				15.85
	Guarantee			10.00	4.00	14.00	2.00				15.00
10162	Warrior H. G. Excelsior Acid Phosphate	10162	8.49	12.52	3.35	15.87	.10				17.12
	Guarantee			11.50	4.50	16.00	2.00				17.15

10366	Jefferson H. G. Complete..... Guarantee	10366	6.91	9.51	2.46	11.97	45	1.70	2.30	23.14
10163	Warrior H. G. Complete Fertilizer	10163	9.78	9.80	1.88	11.68	37	1.67	2.14	22.55
10164	Warrior H. G. Meal, Acid and Potash Mixture	10164	12.67	8.02	2.03	10.05	13	1.52	2.00	20.60
10353	Warrior S. G. Slaughter House Blood, Bone and Potash..... Guarantee	10353	8.90	7.00	3.00	10.00	2.00	1.65	2.00	20.19
10354	S. G. German Kainit	10354	3.11	6.77	2.20	8.97	1.18	2.68	3.34	24.44
	Guarantee			6.00	2.00	8.00	2.00	1.65	12.56	17.89
	* Jefferson H. G. English Acid Phosphate								12.00	14.44
	Guarantee			12.00	2.00	14.00	2.00			15.20
LAUREL OIL & FERTILIZER COMPANY, Laurel, Miss.										
10213	H. G. Acid Phosphate	10213	7.01	15.62	2.67	18.29	.83			19.85
9463	H. G. Acid Phosphate	9463	7.82	13.00	3.00	16.00	2.00			17.30
9464	S. G. Acid Phosphate	9464	6.11	12.51	3.53	16.04	2.23			17.29
	Guarantee			12.00	2.00	14.00	2.00			15.20
10032	S. G. K. C. Ammoniated Bone	10032	11.77	11.46	3.91	15.37	2.90			16.52
	Guarantee			10.00	2.00	12.00	2.00			13.00
10000	S. G. Meal and Phosphate Mixture	10000	4.56	8.03	2.47	10.50	1.57	1.11	2.17	19.01
9405	S. G. Plow Brand	9405	9.54	8.47	3.81	12.28	1.75	1.22	2.00	17.85
10106	S. G. German Kainit	10106	7.96	7.50	2.00	9.50	2.00	2.00	1.59	21.30
	Guarantee			7.50	2.00	9.50	2.00	1.65	1.50	19.11
									13.90	15.99
									12.00	13.80
LOTTERHOS & HUBER COMPANY, Crystal Springs, Miss.										
9733	Castor Pomace	9733	9.43				1.96	5.12	75	21.04
	Guarantee						1.50	4.50	50	18.20
MARBACH & EAGAN, Crystal Springs, Miss.										
9811	Bat Guano	9811	9.08				7.87	5.75	1.79	27.56
	Guarantee						1.50	4.50	50	18.20

* Official sample was not submitted for analysis.

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Insoluble Per Cent.	Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.					
9743	McMILLAN & HARRISON, Mobile, Ala. H. G. Acid Phosphate Guarantee H. G. Muriate of Potash Guarantee S. G. Perfection Guano Guarantee S. G. German Kainit Guarantee	9743	7.09	10.98	5.09	16.07	.42				17.17
10351			12.00	2.00	14.00	.75			49.55	56.98	
9744		10.17	6.92	2.85	9.77	1.48	2.01	2.35	21.68		
9745		3.82	5.40	2.40	7.80	.80	2.30	2.60	20.74		
								13.88	15.96		
							12.50	14.38			
MERIDIAN FERTILIZER FACTORY, Meridian, Miss.											
9751	S. G. Meridian English Acid Phosphate Guarantee	9751	9.66	9.04	5.31	14.35	1.32				15.25
9752	H. G. Meridian Southern Acid Phosphate Guarantee	9752	8.49	13.53	2.27	15.80	.29				13.00
9753	H. G. Meridian Union Special Acid Phosphate Guarantee	9753	9.25	16.32	1.15	17.47	1.36				17.15
9754	H. G. Meridian Bone and Potash Guarantee	9754	10.86	13.00	3.00	16.00	1.00				15.20
9755	S. G. Meridian Blood and Bone Guarantee	9755	7.72	7.61	4.27	11.88	1.35			2.90	19.10
9756	H. G. Meridian Corn Grover Guarantee	9756	9.13	10.00	2.00	12.00	1.00			2.00	17.16
				7.87	3.82	11.69	2.20	1.34	2.79	21.88	2.00
				7.00	3.00	10.00	1.00	1.65	1.50	19.61	17.30
				8.07	2.67	10.74	.51	2.13	2.87	23.91	19.10
				7.00	2.00	9.00	1.00	2.10	2.00	20.78	17.00

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.	
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.				
MT. PLEASANT FERTILIZER COMPANY, Mt. Pleasant, Tenn.											
9776	H. G. Big Success Mt. Pleasant Special Acid Phosphate Guarantee.	9776	12.71	10.32	4.00	14.32	1.00			15.35	
9777	S. G. Black Patch Mt. Pleasant Soluble Bone Guarantee.	9777	2.85	9.65	5.44	14.00	2.00			15.20	
9778	H. G. Big Success Dissolved Bone Guarantee.	9778	11.82	11.44	3.54	14.98	1.99			16.06	
9779	S. G. Big Success Banner Grain Grower Guarantee.	9779	7.08	4.80	6.87	11.67	7.65		1.84	13.00	
9780	O. G. Big Success Cotton Grower Guarantee.	9780	8.39	4.89	6.04	10.93	7.18	.94	2.00	14.00	
9781	S. G. Georgia Electric Corn and Cotton Grower Guarantee.	9781	11.07	7.52	5.99	13.51	2.93	.82	1.00	15.93	
9782	S. G. North Mississippi Cotton Grower Guarantee.	9782	9.58	5.35	5.12	10.47	3.80	1.63	2.24	18.19	
10823	Nitrate of Soda	10823	1.42	7.00	3.00	10.00	5.00	1.65	2.00	14.00	
9783	H. G. Soil Builder and Plant Food Guarantee.	9783	7.36	5.21	5.63	10.84	4.86	14.88	1.19	19.53	
9784	S. G. White as Snow Cotton Special Guarantee.	9784	7.17	2.29	6.96	9.25	8.26	15.00	1.00	19.04	
9785	S. G. German Kaint Guarantee.	9785	1.49	6.00	2.00	8.00	5.00	55.80	2.06	56.25	
								1.62	2.00	20.89	
								1.65	1.72	18.64	
								1.67	2.00	17.89	
								1.65	13.54	15.57	
									12.00	13.80	

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
10886	H. G. Acid Phosphate Guarantee.....	10886	7.60	12.47	3.36	15.83	1.85			17.08
10887	S. G. Acid Phosphate Guarantee.....	10887	10.04	12.00	4.11	14.00	2.00			15.20
10888	S. G. Banner C. & C. Brand Guarantee.....	10888	6.58	9.11	2.00	13.22	2.58			14.13
10889	H. G. Farmers Special Mixture Guarantee.....	10889	4.41	10.00	2.00	12.00	2.00	1.90	2.38	13.00
				5.42	4.19	9.61	1.14	1.65	2.25	20.98
				7.00	1.50	8.50	1.50	1.65	2.25	18.82
				6.78	4.28	11.06	2.44	2.53	.53	22.94
				8.00	3.50	11.50	1.50	2.25	.50	22.46
9810	H. G. Sodium Nitrate New Orleans, La. Guarantee.....	9810	.72					15.12		56.70
								15.00		56.25
9454	Planters S. G. Acid Phosphate New Orleans, La. Guarantee.....	9454	15.42	7.82	7.32	15.14	.75			15.92
9455	Planters S. G. Blood, Bone and Potash Guarantee.....	9455	13.78	10.00	2.00	12.00	2.00	1.83	2.12	13.00
9456	Planters S. G. Cotton and Corn No. 1 Guarantee.....	9456	11.51	8.43	4.83	13.26	.33	1.65	2.00	24.73
9457	Planters H. G. Cotton and Corn Maker Guarantee.....	9457	12.07	7.50	2.50	10.00	2.00	1.65	2.00	20.24
				6.72	3.62	10.34	.93	1.97	2.97	22.85
				7.00	2.50	9.50	2.00	1.65	1.50	19.06
				7.22	4.35	11.57	.95	1.84	2.31	23.01
				7.50	2.50	10.00	2.00	1.65	2.00	20.24

9458	Planters S. G. Golden Mixture Guarantee	9458	11.23	6.79	3.67	10.46	.99	2.07	3.15	23.57
9459	Planters S. G. R. B. Superphosphate Guarantee	9459	11.58	6.04	3.59	9.63	1.27	1.92	1.50	19.06
9460	Planters S. G. German Kamit Guarantee	9460	3.20	7.00	2.50	9.50	2.00	1.65	2.50	21.27
	* Planters H. G. Acid Phosphate Guarantee								1.50	19.06
	* Planters H. G. Vegetable Grower Guarantee								14.40	16.56
									12.00	13.80
				12.50	3.50	16.00	2.00			17.25
				5.50	2.00	7.50	2.00	2.50	3.50	22.20
PLANTERS OIL MILL & GIN COMPANY, Kosciusko, Miss.										
9881	H. G. Acid Phosphate Guarantee	9881	12.37	11.74	2.54	14.28	1.89			15.45
10890	S. G. Peerless Guano Guarantee	10890	11.82	7.70	3.38	11.08	.84	1.58	2.00	15.10
9882	S. G. German Kamit Guarantee	9882	1.52	8.00	1.50	9.50	1.00	1.67	1.75	19.53
									13.12	15.09
									12.00	13.80
READ PHOSPHATE COMPANY, Nashville, Tenn.										
10002	Read's Special H. G. Acid Phosphate Guarantee	10002	4.48	16.22	2.60	18.82	.63			20.44
10003	Read's H. G. Acid Phosphate Guarantee	10003	5.09	13.00	3.00	16.00	2.00			17.30
10004	Read's Matchless S. G. Acid Phosphate Guarantee	10004	2.87	12.00	3.92	15.95	2.16			17.15
10005	Read's S. G. Alkaline Bone Guarantee	10005	3.32	12.00	2.00	14.00	2.00			15.20
10006	Read's S. G. Blood and Bone No. 1 Guarantee	10006	4.04	9.74	4.54	14.28	4.82			15.25
10007	Read's S. G. Nitro Phospho Potasso Guarantee	10007	4.37	10.00	2.00	12.00	2.00			13.00
10008	Read's H. G. Red Diamond Special Guarantee	10008	3.58	6.67	4.83	11.50	6.92		2.42	16.10
10009	Read's H. G. Special Potash Mixture Guarantee	10009	2.47	8.00	2.00	10.00	2.00	2.08	2.00	14.10
				7.36	3.62	10.98	1.74		2.76	23.79
				8.00	2.00	10.00	2.00	1.65	1.50	19.71
				7.18	3.69	10.87	3.42	2.13	2.92	24.02
				8.00	2.00	10.00	2.00	1.65	1.50	19.71
				6.84	3.96	10.80	2.14	2.74	4.25	27.73
				8.00	2.00	10.00	2.00	2.00	2.00	23.36
				6.38	4.79	11.17	8.55	2.47	4.55	18.16
				8.00	2.00	10.00	2.00		4.00	16.40

* Official sample was not submitted for analysis.

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Phosphoric Acid.				Moisture—Per Cent.	Nitrogen—Per Cent.				Potash—Per Cent.	Relative Value Per Ton.
			Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.							
10010	Read's H. G. Vegetable Fertilizer Guarantee	10010	3.95 4.06	3.44 2.06	7.39 6.00	8.09 2.00	2.99 2.84	2.57 2.47	6.12 15.82 12.00	25.20 22.01 18.19 13.80			
10011	Read's S. G. German Kainit Guarantee	10011											
REFUGE COTTON OIL COMPANY, Columbus, Miss.													
10866	H. G. Refuge Acid Phosphate	10866	12.22 12.00	3.38 2.00	15.60 14.00	.45 2.00	5.70			16.82 15.20			
10867	S. G. Columbus Home Made Fertilizer	10867	8.26 8.00	2.45 2.00	10.71 10.00	.59 2.00	8.11	1.77 1.65	1.72 1.50	21.22 19.71			
10868	H. G. Columbus Vegetable Compound	10868	5.07 6.00	3.14 2.00	8.21 8.00	.93 2.00	10.31	2.83 4.00	4.44 6.00	25.26 31.30			
10869	S. G. Post Oak Special Fertilizer	10869	5.45 5.00	3.79 2.00	9.24 7.00	.26 2.00	6.73	3.77 4.00	1.28 1.00	26.32 24.35			
10870	H. G. Refuge Potash and Acid	10870	8.75 10.00	3.50 2.00	12.25 12.00	.42 2.00	12.58		2.30 3.42	17.00 20.16			
10871	S. G. Sandy Land Special	10871	5.85 5.00	2.13 2.00	7.98 7.00	.45 2.00	10.54	1.83 1.65	3.42 4.00	20.16 18.99			
SHUBUTA OIL & M'FG. COMPANY, Shubuta, Miss.													
12107	H. G. Shubuta Acid Phosphate	12107	11.99 10.00	3.63 4.00	15.62 14.00	.87 1.00	14.53			16.82 15.00			
12108	S. G. Shubuta Mixture	12108	7.00 6.00	2.87 3.00	9.87 9.00	1.06 1.00	12.60	1.69 1.65	1.82 1.60	19.99 18.53			

SOUTHERN OIL & FERTILIZER COMPANY,
Meridian, Miss.

[illegible]

STANDARD GUANO & CHEMICAL M'F'G. COMPANY,
New Orleans, La.

9427	H. G. Stern's Acid Phosphate Guarantee	14.97	9.74	6.36	16.10	1.43	17.07
9428	H. G. Stern's Acid Phosphate Guarantee	16.49	10.23	5.44	15.67	1.00	17.40
9429	S. G. Stern's Acid Phosphate Guarantee	11.43	8.32	5.62	13.94	2.00	16.69
9430	H. G. Dissolved Bone Guarantee	18.62	14.32	2.12	16.44	1.00	15.20
9431	S. G. Blood, Bone and Meat Guarantee	15.18	7.78	2.73	10.51	1.50	14.77
9919	S. G. Boll Weevil Knocker Guarantee	14.12	6.70	4.53	11.23	1.18	13.00
9432	S. G. Champion Farmers Choice Guarantee	7.72	8.46	2.32	10.78	1.65	17.89
9433	H. G. Ground Bone Guarantee	7.72	7.00	2.50	9.50	1.00	21.23
						1.50	19.06
						3.37	22.86
						2.50	18.65

* Official sample was not submitted for analysis.

SWIFT FERTILIZER WORKS, Atlanta, Ga.		9468	13.30	6.06	6.56	12.62	1.71			13.23
Swift's Chatahoochee	H. G. Acid Phosphate	9468	13.30	6.06	6.56	12.62	1.71			13.23
	Guarantee			7.00	5.00	12.00	1.50			12.70
Swift's Cultivator	H. G. Acid Phosphate	9469	13.91	12.73	2.00	14.73	.55			16.00
	Guarantee			9.00	5.00	14.00	1.50			14.90
Swift's H. G. Bone Meal		9470	4.93				26.22	2.88		23.91
	Guarantee						25.00	2.47		21.76
Swift's Cotton King	H. G. Guano	9471	10.68	5.22	3.99	9.21	2.51	2.49	2.46	22.82
	Guarantee			6.00	3.00	9.00	1.50	2.47	2.00	22.06
Swift's Cotton Plant	S. G. Guano	9472	10.50	4.91	4.94	9.85	1.84	1.73	1.48	19.52
	Guarantee			6.00	3.00	9.00	1.50	1.65	1.00	17.84
Swift's Eagle	H. G. Guano	9473	10.57	6.37	4.42	10.79	2.00	1.73	2.48	21.85
	Guarantee			6.50	3.50	10.00	1.50	1.65	2.00	20.14
Swift's Farmers Home	H. G. Acid Phosphate and Potash	9474	12.67	4.71	5.88	10.59	1.55		4.43	17.21
	Guarantee			6.00	4.00	10.00	1.50		4.00	16.20
Swift's Field and Farm	S. G. Acid Phosphate and Potash	9475	12.18	4.20	6.06	10.26	1.88		2.39	14.45
	Guarantee			6.00	4.00	10.00	1.50		2.00	13.90
Swift's Golden Harvest	S. G. Guano	9476	10.12	4.62	3.95	8.57	1.83	1.82	2.13	19.16
	Guarantee			5.50	2.50	8.00	1.50	1.65	2.00	17.84
Swift's Monarch	H. G. Guano	9477	9.43	4.62	4.21	8.83	2.66	3.31	5.51	28.92
	Guarantee			5.50	2.50	8.00	1.50	3.29	4.00	26.29
Swift's Red Steer	S. G. Guano	9478	9.69	4.45	3.98	8.43	1.91	1.82	2.05	18.90
	Guarantee			5.50	2.50	8.00	1.50	1.65	2.00	17.84
Swift's S. G. German Kainit		9479	4.12						12.08	13.89
	Guarantee								12.00	13.80
TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.		9805	10.62	8.93	5.08	14.01	2.90			14.90
Ox H. G. Dissolved Bone		9805	10.62	8.93	5.08	14.01	2.90			14.90
	Guarantee			8.00	6.00	14.00	1.00			14.80
Ox H. G. Ammoniated Bone		9806	9.00	6.61	5.46	12.07	2.64	1.72	2.39	23.14
	Guarantee			6.00	4.00	10.00	1.00	1.65	2.00	20.09
Ox S. G. Cotton Guano		9807	8.40	6.31	5.29	11.60	2.94	1.81	2.29	22.81
	Guarantee			6.00	4.00	10.00	1.00	1.65	1.00	18.94
Ox S. G. Potash Mixture		9808	8.40	4.81	6.99	11.80	4.12		2.48	16.31
	Guarantee			6.00	4.00	10.00	1.00		2.00	13.90
Ox S. G. Slaughter House Bone		9809	8.29	4.87	4.39	9.26	5.04	1.87	2.50	20.56
	Guarantee			6.00	2.00	8.00	1.00	1.65	2.00	18.89

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
TENNESSEE VALLEY FERTILIZER COMPANY, Florence, Ala.										
10873	Tiger H. G. Acid Phosphate 16% Guarantee	10873	8.41	15.49 12.00	2.64 4.00	18.13 16.00	1.15 2.00			19.89 17.20
10165	S. G. Dissolved Bone Guarantee	10165	11.96	9.13 10.00	2.43 2.00	11.56 12.00	3.50 2.00			12.47 13.06
10166	Tiger H. G. Dissolved Bone Guarantee	10166	11.67	9.31 12.00	3.21 2.00	12.52 14.00	2.51 2.00			13.45 15.20
10167	S. G. Ashcraft's Formula Guarantee	10167	9.05	9.15 8.00	3.18 2.00	12.33 10.00	3.20 2.00		3.31 2.00	18.28 14.00
10168	S. G. Blood and Bone Guarantee	10168	7.00	7.92 8.00	3.18 2.00	11.10 10.00	1.88 2.00	2.12 1.65	4.04 3.65	25.60 19.71
10169	H. G. Florence Fertilizer Guarantee	10169	8.75	6.50 8.00	2.95 2.00	9.45 10.00	3.21 2.00	1.23 1.65	3.65 2.00	19.86 20.29
10170	S. G. King Cotton Grower Guarantee	10170	9.12	6.08 7.00	2.96 2.00	9.04 9.00	3.38 2.00	1.56 1.65	3.26 1.00	20.15 17.94
10171	S. G. German Kainit Guarantee	10171	6.30						13.38 12.00	15.39 13.80
THREFOOT BROTHERS & COMPANY, Meridian, Miss.										
9765	Threefoot's H. G. English Acid Phosphate Guarantee	9765	9.03	14.70 13.00	2.86 2.00	17.56 15.00	.19 1.00			19.03 16.30
9766	Threefoot's S. G. Prolific Acid Phosphate Guarantee	9766	8.94	11.30 10.00	3.45 3.00	14.75 13.00	.93 1.00			15.88 14.00

9767	Threefoot's H. G. Improved Mixture Guarantee.....	9767	9.42	8.52 7.50	2.60 2.50	11.12 10.00	.55 1.00	1.67 1.67	2.96 2.00	22.75 20.31
TUPELO FERTILIZER FACTORY,										
Tupelo, Miss.										
10854	H. G. Cotton Belt Acid Phosphate 16% Guarantee.....	10854	13.45	13.48 13.00	2.70 3.00	16.18 16.00	.95 1.00			17.53 17.30
10855	H. G. Cotton Belt Acid Phosphate 14% Guarantee.....	10855	14.02	12.77 12.00	2.62 2.00	15.39 14.00	1.42 2.00			16.67 15.20
10856	S. G. Cotton Belt Acid Phosphate 12% Guarantee.....	10856	11.28	12.31 10.00	2.50 2.00	14.81 12.00	2.38 1.00			16.04 15.00
10857	H. G. Levi Phillip's Acid Phosphate 14% Guarantee.....	10857	13.77	12.81 12.00	2.30 2.00	15.11 14.00	1.75 2.00			16.39 15.20
10858	H. G. Tupelo Acid Phosphate 14% Guarantee.....	10858	13.76	12.81 12.00	2.34 2.00	15.15 14.00	1.73 2.00			16.43 15.20
10859	S. G. Cotton Belt Blood and Bone. Guarantee.....	10859	14.93	8.74 8.00	2.89 2.00	11.63 10.00	1.19 1.00	2.34 1.65	2.09 1.50	24.85 19.71
10860	H. G. Cotton Belt Fertilizer Guarantee.....	10860	15.31	8.64 8.00	2.06 2.31	10.70 10.00	1.19 1.00	1.82 1.65	2.23 2.00	22.02 20.29
10861	S. G. Cotton Belt Fertilizer Guarantee.....	10861	15.02	8.61 8.00	2.31 2.00	10.92 10.00	1.10 1.00	1.90 1.65	1.63 1.50	21.87 19.71
10862	S. G. Levi Phillips Mixture Guarantee.....	10862	15.17	8.48 8.00	2.50 2.00	10.98 10.00	1.10 1.00	1.80 1.65	1.71 1.50	21.64 19.71
10863	H. G. Cotton Belt Vegetable Producer Guarantee.....	10863	11.71	3.66 4.00	1.68 2.00	5.34 6.00	.49 1.00	2.44 2.47	7.58 5.00	24.11 22.01
10864	S. G. Tupelo Fertilizer Guarantee.....	10864	14.36	8.06 8.00	2.37 2.00	10.43 10.00	1.38 1.00	1.85 1.65	1.44 1.50	20.87 19.71
10865	S. G. Tupelo German Kainit Guarantee.....	10865	2.92						12.96 12.00	14.90 13.80
VIRGINIA-CAROLINA CHEMICAL COMPANY,										
Memphis, Tenn.										
9713	S. G. I. X. L. Acid Phosphate Guarantee.....	9713	12.98	9.26 8.50	3.04 3.50	12.30 12.00	1.78 2.00			13.23 12.85
9714	S. G. Royal Acid Phosphate Guarantee.....	9714	13.22	9.56 8.50	2.95 3.50	12.51 12.00	1.68 2.00			13.47 12.85
10341	H. G. Royal Dissolved Bone Guarantee.....	10341	10.53	12.37 10.00	3.50 4.00	14.91 14.00	.47 2.00			16.15 15.00

TABLE VI.—Analyses of Brands of Fertilizers Registered for Sale in the State, with Guarantees for Season 1908-1909.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Phosphoric Acid.				Nitrogen—Per Cent.	Potash—Per Cent.	Relative Value Per Ton.
				Water Soluble Per Cent.	Citrate Soluble Per Cent.	Available Per Cent.	Insoluble Per Cent.			
9715	Scott's H. G. Acid Phosphate Guarantee	9715	14.65	10.41	3.49	13.90	1.79			14.94
9716	H. G. V. C. Superphosphate	9716	12.72	11.99	3.35	15.34	1.75			15.00
9717	Victor H. G. Acid Phosphate	9717	14.32	11.50	4.50	16.00	2.00			16.54
				11.50	4.50	16.00	2.00			17.15
				10.49	3.11	13.60	1.86			14.65
10342	S. G. Boll Weevil Conqueror	10342	8.78	10.00	4.00	14.00	2.00			15.00
				13.19	.31	13.50	1.42	1.87		23.18
10343	S. G. Boll Weevil Victor	10343	8.16	7.00	3.35	10.35	2.00	1.65		18.27
				9.10	3.15	12.25	.15	1.91	.56	22.19
10221	S. G. Buck's Best	10221	11.65	7.00	3.00	10.00	2.00	1.65	.35	18.29
				8.98	2.20	11.18	.79	1.88	2.07	22.63
10222	S. G. Buck's Blood, Bone and Potash	10222	10.25	8.53	2.89	11.42	2.05	1.66	1.50	19.61
				7.00	3.00	10.00	2.00	1.66	2.00	21.94
10001	S. G. Eclipse Soluble Guano	10001	10.99	7.00	3.00	10.00	2.00	1.65	1.50	19.61
				7.94	3.46	11.40	.99	1.38	.97	19.62
9718	H. G. Memphis Truck Special	9718	7.85	6.50	3.00	9.50	2.00	1.65	1.00	18.44
				4.84	2.84	7.68	1.06	3.43	3.76	26.12
9719	S. G. Mobile Double Eagle Guano	9719	10.18	5.00	2.00	7.00	2.00	3.30	4.00	25.18
				7.10	3.89	10.99	.59	1.91	1.90	22.15
9720	S. G. Mobile R. B. Ammoniated Superphosphate	9720	10.30	7.00	3.00	10.00	2.00	1.65	1.50	19.61
				6.37	4.33	10.70	.52	1.84	1.74	21.31
9721	S. G. Mobile Standard Guano	9721	9.26	5.85	3.53	9.38	.54	2.18	2.38	21.82
				6.00	2.50	8.50	2.00	1.65	2.00	18.44

9722	H. G. Muriate of Potash Guarantee	9722	1.53							51.45 49.00	59.17 56.25
9723	H. G. Nitrate of Soda Guarantee	9723	2.07							14.22 15.00	53.33 56.25
9724	S. G. Richmond Double Eagle Guano Guarantee	9724	10.04			10.99				1.90	22.21
9725	S. G. Royal Blood, Bone and Potash Guarantee	9725	10.32			10.52				1.65	19.61
9726	S. G. Royal Cotton Boll Guano Guarantee	9726	9.72			9.49				1.90	21.56
9727	H. G. Royal Vegetable Fertilizer Guarantee	9727	9.57			8.64				1.65	19.61
9728	S. G. Scott's Gossypium Phospho Guarantee	9728	10.46			10.82				2.17	22.26
10018	H. G. Scott's Potasso Phospho Guarantee	10018	12.58			11.89				1.65	18.44
9729	S. G. Scott's State Standard Guano Guarantee	9729	11.12			12.00				2.64	24.54
9730	H. G. Sulphate of Potash Guarantee	9730	.50			8.50				2.47	23.26
10223	H. G. V. C. Garden Truck Special Guarantee	10223	8.40			7.20				1.98	22.21
9731	S. G. V. C. Standard Guano Guarantee	9731	9.73			11.07				1.65	19.61
9732	S. G. German Kainit Guarantee	9732	2.08			10.00				1.59	18.44
										2.00	16.30
										2.52	19.40
										2.00	18.44
										49.95	57.44
										48.00	55.20
										4.25	36.28
										4.00	30.16
										1.93	22.39
										1.65	19.61
										13.50	15.53
										12.00	13.80
10089	H. G. Acid Phosphate Guarantee	10089	4.78			14.55					15.73
10090	S. G. Mutual Friend Mixture Guarantee	10090	8.85			9.60				1.92	20.60
										1.65	18.80

WESSON COTTON OIL & FERTILIZER COMPANY,
Wesson, Miss.

MISSISSIPPI AGRICULTURAL EXPERIMENT STATION.



BULLETIN No. 127.

INSPECTION AND ANALYSES OF COTTON-SEED MEAL

ON SALE IN MISSISSIPPI

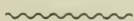


CHEMICAL LABORATORY.

AGRICULTURAL COLLEGE, MISSISSIPPI

DECEMBER, 1909.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



Inspection and Analyses of Cotton-Seed Meal

Mississippi Agricultural and Mechanical College.



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THE INSPECTION AND ANALYSES of COTTON-SEED MEAL.

DECEMBER, 1909.

This bulletin summarizes the results of the inspection of cotton-seed meal for the season of 1908-1909. These analyses present in a fair way the composition of the meal marketed by the various mills. While farmers generally are giving much more attention now than formerly to the comparative values of fertilizers, there appears to be a lack of interest in drawing similar comparisons between the various kinds of cotton-seed meal which can be bought in this state.

If meal is used as a fertilizer, its value depends, of course, upon the amount of plant food contained in a ton of it; if it is first used as a feeding stuff its value will be measured by the food constituents carried by a ton, and the analyses given here are sufficient to bring out the fact clearly, that significant variations in quality are common enough.

Meal for feeding and for fertilizing purposes.—Some farmers may conclude that meal of poor quality, and, therefore undesirable for feeding, can be expected to give good results when applied as a fertilizer. This is not true, because the **nitrogen** in cotton-seed meal is its most valuable constituent whether employed as a fertilizer or used as a feeding stuff, and, therefore, adulterated meal is just as undesirable for feeding plants as for nourishing animals.

Mixtures of meal and hulls.—There would be little practical necessity for maintaining a careful inspection of meal if cotton-seed hulls were always excluded from it, but since various proportions of hulls are generally mixed with the meats before pressing, some form of control becomes essential for the purchaser who possesses no way of ascertaining the extent to which hulls have been used, and, therefore, he is unable to make an intelligent comparison of relative values of the products which he is offered. **Farmers and feeders can no longer**

afford to buy meal simply upon the basis of the price of a ton. Their interest demands and manufacturers ought to expect them to purchase on analysis. The analyses published in this bulletin will supply data which will be found helpful. **The highest grade of meal is the cheapest.**

Comparison of values.—It is well known, of course, that the various grades of meal are made by mixing hulls with the kernels or meats before pressing out the oil, the fertilizer and feeding value of hulls being very low as compared with that of the meal. From the standpoint of the purchaser, this addition of hulls presents no advantages, and since meal is now selling at from 28 to 30 dollars a ton and hulls at about 10 dollars, buyers of meal will find it to their interest to see that the product purchased by them does not contain an undue proportion of hulls. This can be done by ascertaining the guaranteed percentage of nitrogen. Meal high in nitrogen cannot contain a large percentage of hulls, while meal with a low nitrogen content is certain to carry hulls in undesirable proportion. An illustration may make this somewhat clearer.

There appears to be no difficulty in manufacturing meal containing 6.80 per cent of nitrogen, and the analyses in the table show a number of samples to carry over 7.00 per cent.

Cotton-seed hulls may be fairly assumed to contain, say, 0.67 per cent of nitrogen, as against 6.80 per cent in a good grade of meal.

In other words, hulls contain about one-tenth as much nitrogen as good meal, and nitrogen represents the valuable ingredient in meal whether it is used as a fertilizer or fed to stock.

If meal contains 6.18 per cent of nitrogen, it may be classified as **high grade** under the law. **Standard grade** meal must contain 4.95 per cent of nitrogen.

Products complying with the above standards can be produced from the following proportions of meal and hulls on the basis of nitrogen content already given:

Mixture No. 1.

"High Grade Meal".....6.18% Nitrogen.

Can be made as follows:

Cotton-seed meal containing 6.80% nitrogen	1,800 lbs.
Cotton-seed hulls containing 0.67% nitrogen	200 lbs.
Total	2,000 lbs.

Mixture No. 2.

"Standard Grade Meal".....4.95% Nitrogen.

Can be made as follows:

Cotton-seed meal containing 6.80% nitrogen.....	1,400 lbs.
Cotton-seed hulls containing 0.67% nitrogen.....	600 lbs.
Total	2,000 lbs.

Some "Off Grade" meal is sold containing no more than 3.50% of nitrogen, and this may be made as follows:

Mixture No. 3.

"Off Grade Meal".....3.50% Nitrogen.

Can be made as follows:

Cotton-seed meal containing 6.80% nitrogen	925 lbs.
Cotton-seed hulls, containing .67% nitrogen.....	1,075 lbs.
Total	2,000 lbs.

The foregoing examples are sufficient to illustrate the extent to which hulls can be used in making meal that will comply with the legal requirements. Of course seed which will yield under best conditions meal that will contain 7 per cent or more of nitrogen will allow the use of still greater amounts of hulls.

Comparative values.—When meal is used as a fertilizer the comparative value of various grades can be measured, for practical purposes, by the amount of nitrogen contained in them. With nitrogen at 18¾ cents per pound (valuation for season 1908-1909) the comparative values of the grades of meal as given in the foregoing paragraphs are as follows:

1. Cotton-seed meal containing 6.80% nitrogen.....\$25.50 per ton.
2. Cotton-seed meal containing 6.18% nitrogen..... 23.17 per ton.
3. Cotton-seed meal containing 4.95% nitrogen..... 17.54 per ton.
4. Cotton-seed meal containing 3.50% nitrogen..... 13.12 per ton.

Table of comparative values.—Cotton-seed meal of good grade can be purchased now for, say, \$30.00 a ton. Using the percentage of nitrogen alone as a basis for approximate comparison of the relative values of different grades of meal used as a fertilizer and assuming that meal containing no more than, say, 6.50, per cent of nitrogen is

selling for \$30.00 a ton, the comparative values of lower grades (i. e., those containing more hulls) may be computed with the following results:

Meal containing 6.50% of nitrogen.....	\$30.00 per ton.
Meal containing 6.40% of nitrogen.....	29.54 per ton.
Meal containing 6.30% of nitrogen.....	29.10 per ton.
Meal containing 6.20% of nitrogen.....	28.64 per ton.
Meal containing 6.00% of nitrogen.....	27.72 per ton.
Meal containing 5.80% of nitrogen.....	26.79 per ton.
Meal containing 5.50% of nitrogen.....	25.41 per ton.
Meal containing 5.25% of nitrogen.....	24 .25 per ton.
Meal containing 5.00% of nitrogen.....	23.10 per ton.
Meal containing 3.50% of nitrogen.....	16.17 per ton.

Comparative values of,

“High Grade C.-S. Meal”

and

“Standard Grade C.-S. Meal.”

The law requires a minimum guaranty of 6.18% of nitrogen in High Grade meal and 4.95% of nitrogen in Standard Grade meal.

The table of analyses will show that some manufacturers supply an excellent product on a guaranty of 6.18% nitrogen, while others make an effort to sell a meal containing **only a small margin over 6.18%**. In endeavoring to keep this margin within reasonable limits cases are numerous in which meals guaranteed to contain 6.18% nitrogen carry from about 5.80 to 6.18% and more.

“Standard Grade meals” usually contain considerably more nitrogen than the minimum guaranty of 4.95%. But mill owners should make guaranties as high as a safe working margin will allow.

In order, however, to illustrate the difference in the value between high grade and standard grade meal, we will assume that a manufacturer is making these two grades, guaranteeing the

High Grade meal to contain.....6.18% nitrogen.

and

Standard Grade meal to contain.....4.95% nitrogen.

But he will endeavor to allow a safe margin for variations in seed and in mill operation, and will try to make these two grades as follows:

High Grade meal to contain.....6.35% nitrogen.

and

Standard Grade meal to contain 5.12% nitrogen.

If he does this, what difference should be made between the price at which the two grades are sold?

If meal carrying 6.35% of nitrogen can be bought for, say \$30.00 a ton, the comparative values based on nitrogen content will be as follows:

For the High Grade meal.....	\$30.00
For the Standard Grade meal	24.19
Value of the High Grade over the Standard Grade	\$ 5.81

The above illustration is inserted merely as an example of the wide differences in value which exist between meals of different grades. It is by no means sufficient for purchasers to conclude (as many of them probably do) that an arbitrary difference in value, say, of one dollar or two dollars a ton between two grades of meal is an approximate measure of the **actual** difference in value.

Duty of dealers and manufacturers.—Dealers in meal should explain to customers, who fail to insist upon the proper relation between **selling price and fertilizer and feeding value**, the simple method of computing the **approximate** price of meal of any grade when the price of the best meal is known, and they should, themselves, **buy meal otherwise sound and sweet on actual analysis or guarantee and sell it in this way.**

For example, if these bulletins show that a certain mill usually makes meal containing, say, 6.60% of nitrogen (as some of them do) and this meal can be bought for \$30.00 a ton, it is much cheaper than this price than the meal sold by a competitor which will average 6.25% nitrogen, for

$$6.60\% : 6.25\% :: \$30.00 : x$$

x, price of the 6.25% meal when 6.60% meal can be bought for \$30.00 = \$28.71.

If the mills and merchants will insist on selling sound meal on a basis of composition, unfair practices will be eliminated quickly enough and purchasers who have not learned how to properly discriminate between different qualities of meal will have the protection of a business resting in this respect upon a fair and sound commercial basis.

Samples below guaranty.—This bulletin contains analyses of 10 samples and eight representing shipments of high grade meal are much or more than ten per cent below guaranty in nitrogen.

Special attention should be directed to the "Off Grade" meal sold by the Tennessee Fiber Co., and by Daniel Grant, of Memphis, Tenn. This is really not cotton-seed meal. Special attention will be given the "Off Grade" meals this season, and if shipments materially below the guaranty can be located, they will be attached according to the law.

Such low grade mixtures should not be allowed sold in the state as cotton-seed meal. Purchasers should remember that the **best** meal obtainable is the **cheapest**. The meal sold by the above firms was guaranteed to contain only 3.50% of nitrogen and the table will show how few samples reached even this standard.

The table of analyses will show also that a number of mills are making meal slightly under guaranty. These deficiencies often become significant. Manufacturers who persist in selling meal even slightly below guaranty should rightfully expect the purchasing public to turn to competitors for assurance of fairer dealing.

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
ABERDEEN OIL & ICE COMPANY Aberdeen, Miss.		
11305	H. G. Cottonseed Meal	Aberdeen Oil & Ice Co., Aberdeen.....
11762	H. G. Cottonseed Meal	Aberdeen Oil & Ice Co., Aberdeen.....
9682	H. G. Cottonseed Meal	Aberdeen Oil & Ice Co., Aberdeen.....
ALCORN COTTON OIL COMPANY, Corinth, Miss.		
11306	H. G. Cottonseed Meal	Alcorn Cotton Oil Co., Corinth.....
11763	H. G. Cottonseed Meal.....	Alcorn Cotton Oil Co., Corinth.....
11764	H. G. Cottonseed Meal.....	J. D. Furtick, Rienzi.....
ANGUILLA OIL & GIN CO., Anguilla, Miss.		
11307	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
11308	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
11765	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
11766	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
ARCOLA OIL MILL, Arcola, Miss.		
11309	H. G. Cottonseed Meal	Arcola Oil Mill, Arcola
11310	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola
11767	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola
11768	H. G. Cottonseed Meal.....	Smythe-Gaddis & Co., Forest.....
11592	H. G. Cottonseed Meal.....	Lotterhos & Huber Co., Crystal Sp'g.....
BARBER & LEWIS OIL CO., Edwards, Miss.		
11311	H. G. Cottonseed Meal.....	Barber & Lewis Oil Co., Edwards.....
11312	H. G. Cottonseed Meal.....	P. P. Williams Co., Vicksburg.....
11313	H. G. Cottonseed Meal.....	A. H. George & Co., Meridian.....
11314	H. G. Cottonseed Meal.....	Summer Bros., Morton.....
11315	H. G. Cottonseed Meal.....	McMullan & Sons, Hickory.....
11316	H. G. Cottonseed Meal.....	T. B. Gaddis, Morton.....
11769	H. G. Cottonseed Meal.....	P. P. Williams Co., Vicksburg.....
11770	H. G. Cottonseed Meal.....	E. W. Troutman, Long Beach.....
11771	H. G. Cottonseed Meal.....	W. A. McDonald, Bay St. Louis.....
11772	H. G. Cottonseed Meal.....	Barber & Lewis Oil Co., Edwards.....
BARLOW OIL MILL COMPANY, Barlow, Miss.		
11773	H. G. Cottonseed Meal.....	Barlow Oil Mill Co., Barlow..... (No guarantee submitted)

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11305	6.98	6.87	6.18	8.34	7.50	25.76	23.18
11762	7.53	6.78	6.18	8.23	7.50	25.43	23.18
9682	6.83	6.87	6.18	8.34	7.50	25.76	23.18
11306	8.36	6.65	6.18	8.07	7.50	24.94	23.18
11763	7.86	6.49	6.18	7.88	7.50	24.34	23.18
11764	8.20	6.43	6.18	7.81	7.50	24.11	23.18
11307	5.76	5.86	6.18	7.11	7.50	21.98	23.18
11308	6.24	5.89	6.18	7.15	7.50	22.09	23.18
11765	5.99	5.98	6.18	7.26	7.50	22.43	23.18
11766	7.58	6.19	6.18	7.51	7.50	23.21	23.18
11309	7.52	6.28	6.18	7.62	7.50	23.55	23.18
11310	7.45	6.29	6.18	7.64	7.50	23.59	23.18
11767	7.84	6.35	6.18	7.71	7.50	23.81	23.18
11768	7.58	6.19	6.18	7.51	7.50	23.21	23.18
11592	6.76	6.47	6.18	7.85	7.50	24.26	23.18
11311	7.71	5.71	6.18	6.93	7.50	21.41	23.18
11312	8.15	6.20	6.18	7.53	7.50	23.25	23.18
11313	8.05	6.32	6.18	7.67	7.50	23.70	23.18
11314	7.52	5.88	6.18	7.14	7.50	22.05	23.18
11315	9.02	6.14	6.18	7.45	7.50	23.03	23.18
11316	8.62	5.95	6.18	7.22	7.50	22.31	23.18
11769	6.80	5.98	6.18	7.26	7.50	22.43	23.18
11770	9.09	5.87	6.18	7.13	7.50	22.01	23.18
11771	9.55	5.82	6.18	7.07	7.50	21.83	23.18
11772	8.61	5.75	6.18	6.98	7.50	21.56	23.18
11773	7.77	6.82		8.28		25.88	

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	F. W. BRODE & COMPANY, Memphis, Tenn.	
11317	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
11774	H. G. Cottonseed Meal.....	Johnson-Hand Co., Ellisville.....
	BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.	
11318	H. G. Cottonseed Meal.....	Brookhaven Cotton Oil & Fert. Co., Brookhaven
11319	H. G. Cottonseed Meal.....	F. L. Clan, Ruth.....
11320	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg.....
11321	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
11322	H. G. Cottonseed Meal.....	O'Connell & Rudder Co., Bassfield.....
11323	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
11324	H. G. Cottonseed Meal.....	John McGrath & Sons, Brookhaven.....
11775	H. G. Cottonseed Meal.....	Lucedale Commercial Co., Lucedale.....
11776	H. G. Cottonseed Meal.....	C. Atkinson Son's Co., Summit.....
11777	H. G. Cottonseed Meal.....	Premium Merc. Co., Merrill.....
11778	H. G. Cottonseed Meal.....	Sumrall Merc. Co., Sumrall.....
11779	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg.....
11780	H. G. Cottonseed Meal.....	J. W. Williams, Braxton
	BUCKEYE COTTON OIL CO., Jackson, Miss.	
11325	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood.....
11326	H. G. Cottonseed Meal.....	Columbia Grocery Co., Columbia.....
11327	H. G. Cottonseed Meal.....	J. K. Henley, Biloxi
11328	H. G. Cottonseed Meal.....	E. H. Cotton, Summit.....
11329	H. G. Cottonseed Meal.....	J. J. White Lumber Co., McComb
11330	H. G. Cottonseed Meal.....	H. B. Lewis & Co., Columbia.....
11331	H. G. Cottonseed Meal.....	John Berry, Newhebron.....
11332	H. G. Cottonseed Meal.....	J. D. Gambrill & Son, Mize
11333	H. G. Cottonseed Meal.....	J. M. Kelley, Gandisi.....
11334	H. G. Cottonseed Meal.....	T. W. Ford & Co., Eupora.....
11335	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood.....
11781	H. G. Cottonseed Meal.....	The Lampton Co., Columbia
11782	H. G. Cottonseed Meal.....	The Rankin Co., Columbia.....
11783	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood.....
11784	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Jackson.....
11785	H. G. Cottonseed Meal.....	Columbia Grocery Co., Columbia.....
11786	H. G. Cottonseed Meal.....	Foote-Patrick Co., Laurel.....
11787	H. G. Cottonseed Meal.....	Harrison & Nelson Co., Magee.....
11788	H. G. Cottonseed Meal.....	Kennedy & Co., Wiggins.....
11789	H. G. Cottonseed Meal.....	Jones Wilson Merc. Co., Flora.....
11790	H. G. Cottonseed Meal.....	Fernwood Lumber Co., Fernwood.....
11791	H. G. Cottonseed Meal.....	W. H. Westfall, Van Cleave.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton
11317	7.64	6.19	6.18	7.51	7.50	23.21	23.18
11774	7.16	5.99	6.18	7.27	7.50	22.46	23.18
11318	7.47	6.02	6.20	7.31	7.53	22.58	23.25
11319	8.23	6.04	6.20	7.33	7.53	22.65	23.25
11320	6.77	5.75	6.20	6.98	7.53	21.56	23.25
11321	7.03	5.98	6.20	7.26	7.53	22.43	23.25
11322	7.75	6.06	6.20	7.36	7.53	22.73	23.25
11323	8.48	6.00	6.20	7.28	7.53	22.50	23.25
11324	8.13	5.79	6.20	7.03	7.53	21.71	23.25
11775	7.24	5.77	6.20	7.00	7.53	21.64	23.25
11776	8.08	5.74	6.20	6.97	7.53	21.53	23.25
11777	7.85	6.15	6.20	7.47	7.53	23.06	23.25
11778	8.14	5.83	6.20	7.08	7.53	21.86	23.25
11779	8.04	5.88	6.20	7.14	7.53	22.05	23.25
11780	7.97	5.68	6.20	6.90	7.53	21.30	23.25
11325	7.71	5.97	6.18	7.25	7.50	22.39	23.18
11326	7.47	5.57	6.18	6.76	7.50	20.89	23.18
11327	7.06	5.87	6.18	7.13	7.50	22.01	23.18
11328	7.10	6.46	6.18	7.84	7.50	24.23	23.18
11329	7.56	6.35	6.18	7.71	7.50	23.81	23.18
11330	7.75	5.75	6.18	6.98	7.50	21.56	23.18
11331	8.88	6.37	6.18	7.73	7.50	23.89	23.18
11332	7.87	5.89	6.18	7.15	7.50	22.09	23.18
11333	7.65	6.00	6.18	7.28	7.50	22.50	23.18
11334	6.24	6.08	6.18	7.38	7.50	22.80	23.18
11335	6.57	5.93	6.18	7.20	7.50	22.24	23.18
11781	7.81	6.28	6.18	7.62	7.50	23.55	23.18
11782	8.23	5.48	6.18	6.65	7.50	20.55	23.18
11783	7.97	6.23	6.18	7.56	7.50	23.36	23.18
11784	7.28	6.35	6.18	7.71	7.50	23.81	23.18
11785	7.13	5.78	6.18	7.02	7.50	21.68	23.18
11786	7.63	5.74	6.18	6.97	7.50	21.53	23.18
11787	6.38	6.41	6.18	7.78	7.50	24.04	23.18
11788	7.76	5.82	6.18	7.07	7.50	21.83	23.18
11789	8.26	6.28	6.18	7.62	7.50	23.55	23.18
11790	7.93	6.20	6.18	7.53	7.50	23.25	23.18
11791	7.98	5.99	6.18	7.27	7.50	22.46	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11792	H. G. Cottonseed Meal.....	Simmons-Powers Co., Goodman.....
11793	H. G. Cottonseed Meal.....	F. W. Lott, Wiggins.....
11794	H. G. Cottonseed Meal.....	J. W. Williams, Braxton.....
11795	H. G. Cottonseed Meal.....	T. M. Brook Merc. Co., Magee.....
11796	H. G. Cottonseed Meal.....	Stockstill McGehee & Co., Picayune.....
11797	H. G. Cottonseed Meal.....	Jones Co. Farmers Union Wse. Co., Ellisville.....
11798	H. G. Cottonseed Meal.....	A. E. Jennings & Co., Water Valley.....
11799	H. G. Cottonseed Meal.....	Wagner & Co., Water Valley.....
11800	H. G. Cottonseed Meal.....	Holloway & McRaney, Collins.....
11801	H. G. Cottonseed Meal.....	J. C. Morgan, Collins.....
11802	H. G. Cottonseed Meal.....	Jones County Gin & Milling Co., Ellisville.....
11803	H. G. Cottonseed Meal.....	The T. B. Bonner Co., Laurel.....
11804	H. G. Cottonseed Meal.....	H. H. Little & Co., Mize.....
11805	H. G. Cottonseed Meal.....	H. P. Gates Merc. Co., Magee.....
11806	H. G. Cottonseed Meal.....	Tom Lyle Grocery Co., Meridian.....
11807	H. G. Cottonseed Meal.....	McHenry Merc. Co., McHenry.....
11808	H. G. Cottonseed Meal.....	J. T. Long, Agent, Meridian.....
11809	H. G. Cottonseed Meal.....	B. R. Brown, Lockhart.....
	BULTER-KYSER OIL & FERTILIZER CO., Fayette, Miss.	
11810	S. G. Cottonseed Meal.....	Butler-Kyser Oil & Fert. Co., Fayette
11811	S. G. Cottonseed Meal.....	Butler-Kyser Oil & Fert. Co., Fayette
	CANTON OIL MILL COMPANY, Canton, Miss.	
11336	H. G. Cottonseed Meal.....	W. L. Dees, Crystal Springs.....
11337	H. G. Cottonseed Meal.....	Canton Oil Mill Co., Canton.....
11812	H. G. Cottonseed Meal.....	Canton Gin Co., Canton.....
	CENTRAL COTTON OIL COMPANY Jackson, Miss.	
11338	H. G. Cottonseed Meal.....	Central Cotton Oil Co., Jackson.....
11339	H. G. Cottonseed Meal.....	E. M. Odom, Star.....
11340	H. G. Cottonseed Meal.....	Conner Lumber Co., Seminary.....
11341	H. G. Cottonseed Meal.....	J. E. McNair, Lumberton.....
11342	H. G. Cottonseed Meal.....	C. Atkinson's Son's Co., Summit.....
11813	H. G. Cottonseed Meal.....	Central Cotton Oil Co., Jackson.....
11814	H. G. Cottonseed Meal.....	J. E. McNair, Lumberton.....
11815	H. G. Cottonseed Meal.....	Conner Lumber Co., Seminary.....
11816	H. G. Cottonseed Meal.....	C. Atkinson's Sons Co., Summit.....
11817	H. G. Cottonseed Meal.....	J. L. Moyse & Bro., Summit.....
11818	H. G. Cottonseed Meal.....	E. M. Odom, Star.....
11819	H. G. Cottonseed Meal.....	Holmes Bros., McComb.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11792	8.44	6.30	6.18	7.65	7.50	23.63	23.18
11793	7.91	5.67	6.18	6.88	7.50	21.26	23.18
11794	7.93	6.04	6.18	7.33	7.50	22.65	23.18
11795	8.01	5.62	6.18	6.82	7.50	21.08	23.18
11796	8.40	5.74	6.18	6.97	7.50	21.53	23.18
11797	8.15	5.56	6.18	6.75	7.50	20.85	23.18
11798	8.37	5.69	6.18	6.91	7.50	21.34	23.18
11799	8.23	6.00	6.18	7.28	7.50	22.50	23.18
11800	8.20	5.88	6.18	7.14	7.50	22.05	23.18
11801	8.33	6.44	6.18	7.82	7.50	24.15	23.18
11802	7.33	6.04	6.18	7.33	7.50	22.65	23.18
11803	7.64	6.23	6.18	7.56	7.50	23.36	23.18
11804	8.40	5.99	6.18	7.27	7.50	22.46	23.18
11805	8.02	6.30	6.18	7.65	7.50	23.63	23.18
11806	8.07	5.98	6.18	7.26	7.50	22.43	23.18
11807	8.01	5.71	6.18	6.93	7.50	21.41	23.18
11808	7.57	5.82	6.18	7.07	7.50	21.83	23.18
11809	7.70	6.35	6.18	7.71	7.50	23.81	23.18
11810	7.16	5.75	4.95	6.98	6.01	21.56	18.56
11811	9.12	5.73	4.95	6.96	6.01	21.49	18.56
11336	7.40	6.33	6.18	7.68	7.50	23.74	23.18
11337	7.33	6.14	6.18	7.45	7.50	23.03	23.18
11812	8.81	5.75	6.18	6.98	7.50	21.56	23.18
11338	6.78	6.52	6.18	7.92	7.50	24.45	23.18
11339	7.80	6.11	6.18	7.42	7.50	22.91	23.18
11340	8.19	6.33	6.18	7.68	7.50	23.74	23.18
11341	8.28	6.19	6.18	7.51	7.50	23.21	23.18
11342	8.27	6.28	6.18	7.62	7.50	23.55	23.18
11813	7.91	6.26	6.18	7.60	7.50	23.48	23.18
11814	7.98	6.19	6.18	7.51	7.50	23.21	23.18
11815	7.85	6.25	6.18	7.59	7.50	23.44	23.18
11816	8.13	6.26	6.18	7.60	7.50	23.48	23.18
11817	8.49	6.21	6.18	7.54	7.50	23.29	23.18
11818	9.96	5.94	6.18	7.21	7.50	22.28	23.18
11819	9.09	5.94	6.18	7.21	7.50	22.28	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
CENTREVILLE COTTON OIL COMPANY, Centreville, Miss.		
11343	S. G. Cottonseed Meal	Centreville Cotton Oil Co., Centreville
11344	S. G. Cottonseed Meal	Centreville Cotton Oil Co., Centreville
11820	S. G. Cottonseed Meal	Centreville Cotton Oil Co., Centreville
CLAY COUNTY COTTON OIL CO., West Point, Miss.		
11345	H. G. Cottonseed Meal	Clay County Cot. Oil Co., West Point
11346	H. G. Cottonseed Meal	O. L. Shaw, Ackerman
11347	H. G. Cottonseed Meal	Clay County Cot. Oil Co., West Point
11348	H. G. Cottonseed Meal	L. T. Wesson, Saltillo
11821	H. G. Cottonseed Meal	D. G. Morrison, Seoba
11822	H. G. Cottonseed Meal	Clay County Cot. Oil Co., West Point
11823	H. G. Cottonseed Meal	J. G. Wilkins and J. W. Wooten, Brooksville
11824	H. G. Cottonseed Meal	Clay County Cot. Oil Co., West Point
COLDWATER COTTON OIL CO., Coldwater, Miss.		
11349	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater....
11350	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater....
11825	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater
11826	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater
CRENSHAW OIL COMPANY, Crenshaw, Miss.		
11351	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw
11352	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw
11827	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw
11828	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw
CRSYTAL SPRINGS OIL MILL, FERTILIZER & M'F'G. CO., Crystal Springs, Miss.		
11353	H. G. Cottonseed Meal	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs
11354	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs
11355	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs
11829	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs
11830	H. G. Cottonseed Meal	Crystal Springs Oil Mill, Fert. & Mfg. Co., Crystal Springs

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11343	7.98	6.62	5.00	8.04	6.07	24.83	18.75
11344	8.23	6.44	5.00	7.82	6.07	24.15	18.75
11820	7.18	5.59	5.00	6.79	6.07	20.96	18.75
11345	7.45	6.68	6.25	8.11	7.59	25.05	23.44
11346	8.38	6.32	6.25	7.67	7.59	23.70	23.44
11347	6.92	6.61	6.25	8.02	7.59	24.79	23.44
11348	7.64	6.64	6.25	8.06	7.59	24.90	23.44
11821	7.27	6.34	6.25	7.70	7.59	23.78	23.44
11822	6.41	6.51	6.25	7.90	7.59	24.41	23.44
11823	6.50	6.73	6.25	8.17	7.59	25.24	23.44
11824	5.64	6.58	6.25	7.99	7.59	24.68	23.44
11349	8.35	6.43	6.18	7.81	7.50	24.11	23.18
11350	6.90	6.63	6.18	8.05	7.50	24.86	23.18
11825	8.51	6.38	6.18	7.75	7.50	23.93	23.18
11826	7.79	6.59	6.18	8.00	7.50	24.71	23.18
11351	6.65	6.91	4.95	8.39	6.01	25.91	18.56
11352	6.65	6.99	4.95	8.49	6.01	26.21	18.56
11827	5.86	6.80	4.95	8.26	6.01	25.50	18.56
11828	6.82	7.04	4.95	8.55	6.01	26.40	18.56
11353	6.07	6.46	6.25	7.84	7.59	24.23	23.44
11354	6.92	6.48	6.25	7.87	7.59	24.30	23.44
11355	7.21	6.69	6.25	8.12	7.59	25.09	23.44
11829	7.93	6.61	6.25	8.02	7.59	24.79	23.44
11830	7.20	6.78	6.25	8.73	7.59	25.43	23.44

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
DEESON OIL MILL, Deeson, Miss.		
11356	S. G. Cottonseed Meal.....	Deeson Oil Mill, Deeson.....
11357	S. G. Cottonseed Meal.....	Deeson Oil Mill, Deeson.....
DELTA OIL COMPANY, Greenville, Miss.		
11358	S. G. Cottonseed Meal.....	Delta Oil Co., Greenville.....
11831	S. G. Cottonseed Meal.....	Delta Oil Co., Greenville.....
DeSOTO OIL COMPANY, Greenville, Miss.		
11359	S. G. Cottonseed Meal.....	DeSoto Oil Co., Greenville.....
11832	S. G. Cottonseed Meal.....	DeSoto Oil Co., Greenville.....
EAGLE COTTON OIL COMPANY, Meridian, Miss.		
11360	H. G. Cottonseed Meal.....	McLeod & Co., Purvis.....
11361	H. G. Cottonseed Meal.....	Forest Gin & M'fg. Co., Forest.....
11362	H. G. Cottonseed Meal.....	A. Roberts & Co., Lauderdale.....
11363	H. G. Cottonseed Meal.....	Weatherbee-Huggins Co., Waynesboro.....
11364	H. G. Cottonseed Meal.....	R. W. Fagan & Co., Waynesboro.....
11365	H. G. Cottonseed Meal.....	W. H. Joyner, Forest.....
11366	H. G. Cottonseed Meal.....	Weatherbee-Huggins Co., Waynesboro.....
11833	H. G. Cottonseed Meal.....	Bufkin & Davis, Buckatunna.....
11834	H. G. Cottonseed Meal.....	Weatherbee-Huggins Co., Waynesboro.....
11835	H. G. Cottonseed Meal.....	C. T. Bonney, Enterprise.....
EASTMAN OIL MILLS, Jonestown, Miss.		
11367	H. G. Cottonseed Meal.....	Eastman Oil Mills, Jonestown.....
11836	H. G. Cottonseed Meal.....	Eastman Oil Mills, Jonestown.....
EXPORTERS COTTON OIL CO., Gulfport, Miss.		
11368	H. G. Cottonseed Meal.....	W. A. Holloway, Mt. Olive.....
11369	H. G. Cottonseed Meal.....	A. Scofide, Bay St. Louis.....
11837	H. G. Cottonseed Meal.....	Farmers Union Warehouse Co., Mize.....
11838	H. G. Cottonseed Meal.....	Donald Bros., Magee.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11356	7.62	6.39	5.50	7.76	6.68	23.96	20.63
11357	6.55	6.35	5.50	7.71	6.68	23.81	20.63
11358	8.20	5.30	4.95	6.43	6.01	19.88	18.56
11831	8.57	5.45	4.95	6.62	6.01	20.44	18.56
11359	6.15	6.28	4.95	7.62	6.01	23.55	18.56
11832	6.33	6.18	4.95	7.50	6.01	23.18	18.56
11360	6.70	6.59	6.18	8.00	7.50	24.71	23.18
11361	7.94	6.49	6.18	7.88	7.50	24.34	23.18
11362	7.63	6.63	6.18	8.05	7.50	24.86	23.18
11363	8.19	6.62	6.18	8.04	7.50	24.83	23.18
11364	7.20	6.56	6.18	7.96	7.50	24.60	23.18
11365	7.15	6.49	6.18	7.88	7.50	24.34	23.18
11366	6.33	6.72	6.18	8.16	7.50	25.20	23.18
11833	7.35	6.18	6.18	7.50	7.50	23.18	23.18
11834	6.52	6.20	6.18	7.53	7.50	23.25	23.18
11835	7.48	6.13	6.18	7.44	7.50	22.99	23.18
11367	7.71	6.36	6.18	7.72	7.50	23.85	23.18
11836	7.78	6.40	6.18	7.77	7.50	24.00	23.18
11368	6.69	6.77	6.20	8.22	7.53	25.39	23.25
11369	6.99	6.89	6.20	8.36	7.53	25.84	23.25
11837	7.68	6.80	6.20	8.26	7.53	25.50	23.25
11838	7.36	6.90	6.20	8.38	7.53	25.88	23.25

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	FRIARS POINT OIL MILL & M'F'G. COMPANY, Friars Point, Miss.	
11370	H. G. Cottonseed Meal.....	Friars Point Oil Mill & M'f'g. Co., Friars Point.....
11371	H. G. Cottonseed Meal.....	Friars Point Oil Mill & M'f'g. Co., Friars Point.....
11839	H. G. Cottonseed Meal.....	Friars Point Oil Mill & M'f'g. Co., Friars Point.....
11840	H. G. Cottonseed Meal.....	Friars Point Oil Mill & M'f'g. Co., Friars Point.....
	A. H. GEORGE & COMPANY, Meridian, Miss.	
11372	H. G. Cottonseed Meal.....	B. R. Fail, Bay Springs.....
11841	H. G. Cottonseed Meal.....	Meyer Bros., Meridian.....
11842	H. G. Cottonseed Meal.....	A. H. George & Co., Meridian.....
11843	H. G. Cottonseed Meal.....	A. H. George & Co., Meridian.....
	J. T. GIBBONS, New Orleans, La.	
11844	H. G. Cottonseed Meal.....	Guy Northrop, Pass Christian.....
	GLEN ALLAN OIL MILL, Glen Allan, Miss.	
11373	H. G. Cottonseed Meal.....	Glen Allan Oil Mill, Glen Allan.....
11845	H. G. Cottonseed Meal.....	Glen Allan Oil Mill, Glen Allan.....
	GLOSTER OIL COMPANY, Gloster, Miss.	
11374	H. G. Cottonseed Meal.....	Gloster Oil Co., Gloster.....
11375	H. G. Cottonseed Meal.....	Gloster Oil Co., Gloster.....
11846	H. G. Cottonseed Meal.....	Gloster Oil Co., Gloster.....
	B. F. GLOVER & SON COM- MISSION CO., New Orleans, La.	
11847	H. G. Cottonseed Meal.....	William Martin, Van Cleave.....
11376	O. G. Cottonseed Meal.....	F. J. Lundey, Ocean Springs.....
11848	O. G. Cottonseed Meal.....	J. & S. Anderson, Van Cleave.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton
11370	7.28	5.71	6.18	6.93	7.50	21.41	23.18
11371	7.28	6.05	6.18	7.34	7.50	22.69	23.18
11839	7.45	5.70	6.18	6.92	7.50	21.38	23.18
11840	6.95	5.93	6.18	7.20	7.50	22.24	23.18
11372	7.29	6.16	6.18	7.48	7.50	23.10	23.18
11841	7.17	6.43	6.18	7.81	7.50	24.11	23.18
11842	7.95	6.16	6.18	7.48	7.50	23.10	23.18
11843	7.74	5.70	6.18	6.92	7.50	21.38	23.18
11844	8.05	5.59	6.18	6.79	7.50	20.96	23.18
11373	6.06	6.50	6.18	7.89	7.50	24.38	23.18
11845	6.24	6.54	6.18	7.94	7.50	24.53	23.18
11374	7.81	6.44	6.18	7.82	7.50	24.15	23.18
11375	8.14	6.59	6.18	8.00	7.50	24.71	23.18
11846	7.90	6.44	6.18	7.82	7.50	24.15	23.18
11847	7.68	6.18	6.18	7.50	7.50	23.18	23.18
11376	9.27	3.71	3.50	4.50	4.25	13.91	13.13
11848	9.24	2.83	3.50	3.44	4.25	10.61	13.13

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
DANIEL GRANT, Memphis, Tenn.		
11377	O. G. Cottonseed Meal	Daniel Grant, Carrollton.....
11378	O. G. Cottonseed Meal	Hyman Merc. Co., Summit.....
11849	O. G. Cottonseed Meal	J. H. McGowan, Pachuta.....
11850	O. G. Cottonseed Meal	Tate Company, Laurel.....
GRENADA OIL MILL, Grenada, Miss.		
11379	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
11380	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
11851	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
11852	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
HAZLEHURST OIL MILL & FERTILIZER CO., Hazlehurst, Miss.		
11381	H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst
11382	H. G. Cottonseed Meal.....	Denman-Alford Co., McComb.....
11383	H. G. Cottonseed Meal.....	Lampton Bros. & Co., Tylertown.....
11384	H. G. Cottonseed Meal.....	Denman-Alford Co., McComb.....
11853	H. G. Cottonseed Meal.....	J. B. Herring, Eddiceton.....
11854	H. G. Cottonseed Meal.....	T. M. Bealle, Jr., Monticello.....
11855	H. G. Cottonseed Meal.....	Simpson Merc. Co., Terry.....
11856	H. G. Cottonseed Meal.....	Denman-Alford Co., McComb.....
HILL CITY OIL WORKS, Vicksburg, Miss.		
11385	H. G. Cottonseed Meal.....	Columbia Grocery Co., Columbia.....
11386	H. G. Cottonseed Meal.....	C. J. Edwards Co., Vicksburg.....
11387	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
11857	H. G. Cottonseed Meal.....	W. M. Conner, Hattiesburg.....
11858	H. G. Cottonseed Meal.....	C. W. Alexander, Montrose.....
11859	H. G. Cottonseed Meal.....	J. E. McNair, Lumberton.....
11860	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
11388	S. G. Cottonseed Meal	Hill City Oil Works, Vicksburg.....
11389	S. G. Cottonseed Meal	W. O. Worrell Co., Vicksburg.....
11861	S. G. Cottonseed Meal	C. J. Edwards Co., Vicksburg.....
HOLLANDALE COTTON OIL CO., Hollandale, Miss.		
11390	S. G. Cottonseed Meal	Hollandale Cotton Oil Co., Hollandale
11391	S. G. Cottonseed Meal	Hollandale Cotton Oil Co., Hollandale
11862	S. G. Cottonseed Meal	Hollandale Cotton Oil Co., Hollandale

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11377	8.57	3.67	3.50	4.46	4.25	13.76	13.13
11378	9.43	2.31	3.50	2.80	4.25	8.66	13.13
11849	8.63	3.38	3.50	4.10	4.25	12.68	13.13
11850	9.40	2.73	3.50	3.31	4.25	10.24	13.13
11379	7.63	6.53	6.18	7.93	7.50	24.49	23.18
11380	7.70	6.47	6.18	7.85	7.50	24.26	23.18
11851	7.87	6.69	6.18	8.12	7.50	25.09	23.18
11852	6.99	6.57	6.18	7.98	7.50	24.64	23.18
11381	6.76	6.62	6.20	8.04	7.53	24.83	23.25
11382	6.94	6.88	6.20	8.35	7.53	25.80	23.25
11383	7.80	6.98	6.20	8.47	7.53	26.18	23.25
11384	7.38	6.90	6.20	8.38	7.53	25.88	23.25
11853	6.09	6.68	6.20	8.11	7.53	25.05	23.25
11854	6.49	6.54	6.20	7.94	7.53	24.53	23.25
11855	7.29	6.64	6.20	8.06	7.53	24.90	23.25
11856	6.95	6.59	6.20	8.00	7.53	24.71	23.25
11385	8.15	5.93	6.18	7.20	7.50	22.24	23.18
11386	6.32	6.34	6.18	7.70	7.50	23.78	23.18
11387	8.32	5.53	6.18	6.71	7.50	20.74	23.18
11857	6.85	6.09	6.18	7.39	7.50	22.84	23.18
11858	7.51	5.49	6.18	6.60	7.50	20.59	23.18
11859	7.35	6.02	6.18	7.31	7.50	22.58	23.18
11860	6.50	6.22	6.18	7.55	7.50	23.23	23.18
11388	7.45	5.98	5.00	7.26	6.07	22.43	18.75
11389	8.29	5.19	5.00	6.30	6.07	19.46	18.75
11861	7.74	4.94	5.00	6.00	6.07	18.53	18.75
11390	7.05	6.34	5.00	7.70	6.07	23.78	18.75
11391	7.67	6.26	5.00	7.60	6.07	23.48	18.75
11862	6.55	6.02	5.00	7.30	6.07	22.58	18.75

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	HOLLYWOOD OIL MILL, Hollywood, Miss.	
11392	H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
11393	H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
11863	H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
	HOUSTON COTTON OIL CO., Houston, Miss.	
11394	H. G. Cottonseed Meal.....	Houston Cotton Oil Co., Houston.....
11395	H. G. Cottonseed Meal.....	Houston Cotton Oil Co., Houston..... (No guarantee submitted.)
	IMPERIAL COTTON OIL CO., Macon, Miss.	
11396	H. G. Cottonseed Meal.....	Imperial Cotton Oil Co., Macon.....
11397	H. G. Cottonseed Meal.....	Imperial Cotton Oil Co., Macon.....
	INDEPENDENT OIL & FERTI- LIZER WORKS, Columbus, Miss.	
11398	H. G. Cottonseed Meal.....	Independent Oil & Fert. Works, Columbus
11399	H. G. Cottonseed Meal.....	Independent Oil & Fert. Works, Columbus
11864	H. G. Cottonseed Meal.....	Independent Oil & Fert. Works, Columbus
	INDIANOLA COTTON OIL CO., Indianola, Miss.	
11400	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola...
11401	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola...
11865	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola...
11866	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola...
	ITTA BENA COTTON OIL CO., Itta Bena, Miss.	
11402	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena...
11403	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena...
11867	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena...
11868	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena...

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11392	6.83	6.51	6.18	7.90	7.50	24.41	23.18
11393	6.81	6.31	6.18	7.66	7.50	23.66	23.18
11863	5.36	6.18	6.18	7.50	7.50	23.18	23.18
11394	6.55	6.88	6.18	8.35	7.50	25.80	23.18
11395	7.33	6.64	6.18	8.06	7.50	24.90	23.18
11396	8.23	5.93	6.18	7.20	7.50	22.24	23.18
11397	7.06	5.46	6.18	6.63	7.50	20.48	23.18
11398	8.08	6.07	6.18	7.37	7.50	22.76	23.18
11399	7.33	6.32	6.18	7.67	7.50	23.70	23.18
11864	7.56	6.28	6.18	7.62	7.50	23.55	23.18
11400	7.25	6.36	6.18	7.72	7.50	23.85	23.18
11401	8.08	6.57	6.18	7.98	7.50	24.64	23.18
11865	6.16	6.18	6.18	7.50	7.50	23.18	23.18
11866	6.55	6.44	6.18	7.82	7.50	24.15	23.18
11402	6.08	6.30	6.18	7.65	7.50	23.63	23.18
11403	7.66	5.92	6.18	7.19	7.50	22.20	23.18
11867	6.29	5.99	6.18	7.27	7.50	22.46	23.18
11868	5.83	5.78	6.18	7.02	7.50	21.68	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
JACKSON FERTILIZER CO., Jackson, Miss.		
11404	H. G. Cottonseed Meal.....	R. F. Everett, Braxton.....
11405	H. G. Cottonseed Meal.....	Story & Company, Forest.....
JACKSON OIL & REFINING CO., Jackson, Miss.		
11406	H. G. Cottonseed Meal.....	Johnson-Woodward Co., Mt. Olive....
11407	H. G. Cottonseed Meal.....	J. B. Pool, Union.....
11408	H. G. Cottonseed Meal.....	Gaddis, McLaurin Co., Raymond.....
11409	H. G. Cottonseed Meal.....	C. W. Magee, Braxton.....
11410	H. G. Cottonseed Meal.....	W. F. Bone, Monticello.....
11411	H. G. Cottonseed Meal.....	W. L. Dees, Crystal Springs.....
11412	H. G. Cottonseed Meal.....	R. H. Coke, Mendenhall.....
11869	H. G. Cottonseed Meal.....	H. P. Gates Merc. Co., Magee.....
11870	H. G. Cottonseed Meal.....	Conner Lumber Co., Seminary.....
11871	H. G. Cottonseed Meal.....	R. F. Allbritton, D'Lo.....
11872	H. G. Cottonseed Meal.....	J. L. Parkman, Oakvale.....
11873	H. G. Cottonseed Meal.....	R. H. Coke, Mendenhall.....
11874	H. G. Cottonseed Meal.....	O. Hopkins, Hickory.....
JEFFERSON GIN & OIL MILL, Harriston, Miss.		
11413	H. G. Cottonseed Meal.....	Jefferson Gin & Oil Mill, Harriston....
11414	H. G. Cottonseed Meal.....	Jefferson Gin & Oil Mill, Harriston....
11875	H. G. Cottonseed Meal.....	Jefferson Gin & Oil Mill, Harriston....
LAUREL OIL & FERTILIZER CO., Laurel, Miss.		
11415	H. G. Cottonseed Meal.....	J. F. Wilson, Philadelphia.....
11416	H. G. Cottonseed Meal.....	W. A. Gunn, Noxapater.....
11417	H. G. Cottonseed Meal.....	The T. B. Bonner Co., Sandersville....
11418	H. G. Cottonseed Meal.....	W. W. Pigford, Lumberton.....
11419	H. G. Cottonseed Meal.....	Jones Co. Gin & Milling Co., Ellisville
11420	H. G. Cottonseed Meal.....	Kennedy Bros., New Augusta.....
11876	H. G. Cottonseed Meal.....	E. B. Perry, Taylorsville.....
11877	H. G. Cottonseed Meal.....	Dorsett Bros., Merrill.....
11878	H. G. Cottonseed Meal.....	Alf. Pace, Union.....
11879	H. G. Cottonseed Meal.....	W. W. Pigford, Lumberton.....
11880	H. G. Cottonseed Meal.....	Hicks Merc. Co., Laurel.....
11881	H. G. Cottonseed Meal.....	W. M. Hyde & Co., Poplarville.....
11882	H. G. Cottonseed Meal.....	T. E. Winn, Laurel.....
11883	H. G. Cottonseed Meal.....	Tate Company, Laurel.....
11884	H. G. Cottonseed Meal.....	Laurel Oil & Fert. Co., Laurel.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11404	7.78	6.04	6.18	7.33	7.50	22.65	23.18
11405	7.69	6.15	6.18	7.47	7.50	23.06	23.18
11406	7.38	6.55	6.18	7.95	7.50	24.56	23.18
11407	7.80	6.37	6.18	7.73	7.50	23.89	23.18
11408	7.96	6.62	6.18	8.04	7.50	24.83	23.18
11409	7.70	6.54	6.18	7.94	7.50	24.53	23.18
11410	8.87	6.59	6.18	8.00	7.50	24.71	23.18
11411	8.30	6.46	6.18	7.84	7.50	24.23	23.18
11412	8.04	6.43	6.18	7.81	7.50	24.11	23.18
11869	7.87	6.04	6.18	7.33	7.50	22.65	23.18
11870	7.37	6.13	6.18	7.44	7.50	22.99	23.18
11871	7.55	6.18	6.18	7.50	7.50	23.18	23.18
11872	6.74	6.22	6.18	7.55	7.50	23.33	23.18
11873	7.20	6.34	6.18	7.70	7.50	23.78	23.18
11874	6.44	6.32	6.18	7.67	7.50	23.70	23.18
11413	8.74	6.07	6.18	7.37	7.50	22.76	23.18
11414	8.64	6.36	6.18	7.72	7.50	23.85	23.18
11875	8.25	6.04	6.18	7.33	7.50	22.65	23.18
11415	7.78	6.01	6.18	7.30	7.50	22.54	23.18
11416	7.77	6.67	6.18	8.10	7.50	25.01	23.18
11417	8.83	6.18	6.18	7.50	7.50	23.18	23.18
11418	7.99	6.12	6.18	7.43	7.50	22.95	23.18
11419	7.72	6.58	6.18	7.99	7.50	24.68	23.18
11420	8.16	6.61	6.18	8.02	7.50	24.79	23.18
11876	8.11	5.99	6.18	7.27	7.50	22.46	23.18
11877	8.16	5.89	6.18	7.15	7.50	22.09	23.18
11878	8.37	5.88	6.18	7.14	7.50	22.05	23.18
11879	7.75	6.22	6.18	7.55	7.50	23.33	23.18
11880	8.63	6.18	6.18	7.50	7.50	23.18	23.18
11881	7.80	6.14	6.18	7.45	7.50	23.03	23.18
11882	8.30	6.13	6.18	7.44	7.50	22.99	23.18
11883	8.00	6.25	6.18	7.59	7.50	23.44	23.18
11884	7.54	6.58	6.18	7.99	7.50	24.68	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	LELAND OIL WORKS, Leland, Miss.	
11421	S. G. Cottonseed Meal	Hart Lumber Co., Stallo.....
11885	S. G. Cottonseed Meal	Leland Oil Works, Leland.....
11886	S. G. Cottonseed Meal	Leland Oil Works, Leland.....
	LEXINGTON COTTON OIL CO., Lexington, Miss.	
11422	H. G. Cottonseed Meal.....	Lexington Cotton Oil Co., Lexington...
11423	H. G. Cottonseed Meal.....	Lexington Cotton Oil Co., Lexington...
11887	H. G. Cottonseed Meal.....	Lexington Cotton Oil Co., Lexington
	MAGNOLIA OIL MILL & M'F'G. COMPANY, Magnolia, Miss.	
11424	H. G. Cottonseed Meal.....	The Lampton Co., Columbia.....
11425	H. G. Cottonseed Meal.....	Magnolia Oil Mill & M'f'g. Co., Magnolia
11888	H. G. Cottonseed Meal.....	Magnolia Oil Mill & M'f'g. Co., Magnolia
	MERIDIAN FERT. FACTORY, Meridian, Miss.	
11426	H. G. Golden Rod Choice Cottonseed Meal	J. H. Williams & Sons, Prentiss.....
11427	H. G. Golden Rod Choice Cottonseed Meal	W. L. Bullard, Decatur.....
11428	H. G. Golden Rod Choice Cottonseed Meal	J. N. Tabor, Louisville.....
11429	H. G. Golden Rod Choice Cottonseed Meal	Holloway & McRaney, Collins
11430	H. G. Golden Rod Choice Cottonseed Meal	H. N. Stuart & Sons, Morton.....
11889	H. G. Golden Rod Choice Cottonseed Meal	H. N. Stuart & Sons, Morton
11890	H. G. Golden Rod Choice Cottonseed Meal	J. L. Wells, Hickory.....
11891	H. G. Golden Rod Choice Cottonseed Meal	A. D. Crenshaw, Neshoba.....
11892	H. G. Golden Rod Choice Cottonseed Meal	T. M. Steele & Son, Forest.....
11893	H. G. Golden Rod Choice Cottonseed Meal	O. Hopkins, Hickory.....
11431	H. G. Cottonseed Meal.....	K. C. Hall, Heidelberg.....
11432	H. G. Cottonseed Meal.....	W. M. Prine, Weathersby.....
11433	H. G. Cottonseed Meal.....	Montrose Merc. Co., Montrose.....
11434	H. G. Cottonseed Meal	Berry & Murray, Star.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11421	7.05	5.89	4.95	7.15	6.01	22.09	18.56
11885	6.99	6.06	4.95	7.36	6.01	22.73	18.56
11886	7.47	6.12	4.95	7.43	6.01	22.95	18.56
11422	7.11	6.39	6.25	7.76	7.59	23.96	23.44
11423	8.14	6.08	6.25	7.38	7.59	22.80	23.44
11887	5.85	6.29	6.25	7.64	7.59	23.59	23.44
11424	7.20	6.28	6.18	7.62	7.50	23.55	23.18
11425	8.14	5.66	6.18	6.87	7.50	21.23	23.18
11888	7.30	6.09	6.18	7.39	7.50	22.84	23.18
11426	7.75	6.27	6.59	7.66	8.00	23.51	24.71
11427	8.64	6.54	6.59	7.94	8.00	24.53	24.71
11428	7.82	6.78	6.59	8.23	8.00	25.43	24.71
11429	8.07	6.42	6.59	7.79	8.00	24.08	24.71
11430	7.49	6.44	6.59	7.82	8.00	24.15	24.71
11889	5.46	6.28	6.59	7.62	8.00	23.55	24.71
11890	6.88	6.21	6.59	7.54	8.00	23.29	24.71
11891	6.16	6.36	6.59	7.72	8.00	23.85	24.71
11892	6.84	6.28	6.59	7.62	8.00	23.55	24.71
11893	6.52	6.88	6.59	8.35	8.00	25.80	24.71
11431	8.37	6.49	6.18	7.88	7.50	24.34	23.18
11432	7.65	5.87	6.18	7.13	7.50	22.01	23.18
11433	6.60	6.58	6.18	7.99	7.50	24.68	23.18
11434	7.77	6.21	6.18	7.54	7.50	23.29	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11435	H. G. Cottonseed Meal.....	Mrs. R. J. Briggs, State Line.....
11436	H. G. Cottonseed Meal.....	R. L. Etheridge, Pachuta.....
11894	H. G. Cottonseed Meal.....	R. Watts & Co., Seminary.....
11895	H. G. Cottonseed Meal.....	J. N. Tabor, Louisville.....
11896	H. G. Cottonseed Meal.....	Holloway & McRaney, Collins.....
11897	H. G. Cottonseed Meal.....	Berry & Murray, Star.....
11898	H. G. Cottonseed Meal.....	W. M. Prine, Weathersby.....
11899	H. G. Cottonseed Meal.....	W. M. Hyde & Co., Poplarville.....
11900	H. G. Cottonseed Meal.....	R. Watts & Co., Seminary.....
11901	H. G. Cottonseed Meal.....	J. H. Williams & Son, Prentiss.....
11902	H. G. Cottonseed Meal.....	T. M. Steele & Son, Forest.....
MINTER CITY OIL WORKS, Minter City, Miss.		
11437	H. G. Cottonseed Meal.....	Minter City Oil Works, Minter City.....
11438	H. G. Cottonseed Meal.....	Minter City Oil Works, Minter City.....
11903	H. G. Cottonseed Meal.....	Minter City Oil Works, Minter City.....
11904	H. G. Cottonseed Meal.....	Minter City Oil Works, Minter City.....
MISSISSIPPI COTTON OIL CO., Jackson, Miss.		
11439	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Yazoo City.....
11440	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Yazoo City.....
11441	H. G. Cottonseed Meal.....	Biloxi Milling Co., Biloxi.....
11442	H. G. Cottonseed Meal.....	Steens-Bell Warehouse Co., Steens.....
11443	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., West Point.....
11444	H. G. Cottonseed Meal.....	D. F. Love, Koiscusko.....
11445	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Greenville.....
11446	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Greenville.....
11447	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Clarksdale.....
11448	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Clarksdale.....
11449	H. G. Cottonseed Meal.....	F. S. Leavell, Oxford.....
11450	H. G. Cottonseed Meal.....	R. S. Murray, Watter Valley.....
11451	H. G. Cottonseed Meal.....	W. B. Armstrong, Vaiden.....
11452	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
11453	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Natchez.....
11454	H. G. Cottonseed Meal.....	Meyer Bros., Meridian.....
11455	H. G. Cottonseed Meal.....	Picayune Feed & Fert. Co., Picayune.....
11456	H. G. Cottonseed Meal.....	W. W. Mitchell, Poplarville.....
11457	H. G. Cottonseed Meal.....	H. M. Seabrook, State Line.....
11458	H. G. Cottonseed Meal.....	McMullan & Sons, Hickory.....
11459	H. G. Cottonseed Meal.....	Johnson-Hand Co., Ellisville.....
11460	H. G. Cottonseed Meal.....	J. A. McLeod Co., Hattiesburg.....
11461	H. G. Cottonseed Meal.....	R. H. Green & Bro., Jackson.....
11462	H. G. Cottonseed Meal.....	M. E. Berry, Pinola.....
11463	H. G. Cottonseed Meal.....	Gaddis & Slay Co., Magee.....
11464	H. G. Cottonseed Meal.....	J. M. Kelly, Gandsi.....
11465	H. G. Cottonseed Meal.....	A. V. Shearer, Raymond.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11435	7.70	6.73	6.18	8.17	7.50	25.24	23.18
11436	8.03	6.68	6.18	8.11	7.50	25.05	23.18
11894	6.85	6.77	6.18	8.22	7.50	25.39	23.18
11895	7.20	5.93	6.18	7.20	7.50	22.24	23.18
11896	6.67	6.19	6.18	7.51	7.50	23.21	23.18
11897	6.59	5.82	6.18	7.07	7.50	21.83	23.18
11898	7.11	5.74	6.18	6.97	7.50	21.53	23.18
11899	6.18	6.53	6.18	7.93	7.50	24.49	23.18
11900	6.66	6.57	6.18	7.98	7.50	24.64	23.18
11901	6.82	5.79	6.18	7.03	7.50	21.71	23.18
11902	6.61	6.89	6.18	8.36	7.50	25.84	23.18
11437	6.57	6.56	6.18	7.96	7.50	24.60	23.18
11438	9.33	6.44	6.18	7.82	7.50	24.15	23.18
11903	6.32	6.68	6.18	8.11	7.50	25.05	23.18
11904	6.67	6.68	6.18	8.11	7.50	25.05	23.18
11439	7.97	6.45	6.18	7.83	7.50	24.19	23.18
11440	7.79	5.83	6.18	7.08	7.50	21.86	23.18
11441	9.46	6.14	6.18	7.45	7.50	23.03	23.18
11442	7.66	6.29	6.18	7.64	7.50	23.59	23.18
11443	8.52	6.30	6.18	7.65	7.50	23.63	23.18
11444	7.65	6.11	6.18	7.42	7.50	22.91	23.18
11445	7.25	5.95	6.18	7.22	7.50	22.31	23.18
11446	7.33	5.83	6.18	7.08	7.50	21.86	23.18
11447	5.43	6.15	6.18	7.47	7.50	23.06	23.18
11448	7.33	6.29	6.18	7.64	7.50	23.59	23.18
11449	7.32	6.41	6.18	7.78	7.50	24.04	23.18
11450	8.91	6.27	6.18	7.61	7.50	23.51	23.18
11451	8.46	6.12	6.18	7.43	7.50	22.95	23.18
11452	8.61	6.24	6.18	7.58	7.50	23.40	23.18
11453	8.14	6.28	6.18	7.62	7.50	23.55	23.18
11454	7.62	6.25	6.18	7.59	7.50	23.44	23.18
11455	8.02	6.05	6.18	7.34	7.50	22.69	23.18
11456	7.43	6.10	6.18	7.41	7.50	22.88	23.18
11457	8.08	5.81	6.18	7.05	7.50	21.79	23.18
11458	7.49	6.12	6.18	7.43	7.50	22.95	23.18
11459	6.46	6.19	6.18	7.51	7.50	23.21	23.18
11460	8.30	6.24	6.18	7.58	7.50	23.40	23.18
11461	8.68	6.24	6.18	7.58	7.50	23.40	23.18
11462	8.35	6.08	6.18	7.38	7.50	22.80	23.18
11463	7.98	6.02	6.18	7.31	7.50	22.58	23.18
11464	8.62	6.23	6.18	7.56	7.50	23.36	23.18
11465	8.75	6.57	6.18	7.98	7.50	24.64	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11466	H. G. Cottonseed Meal.....	Mutual Merc. Co., -Utica.....
11905	H. G. Cottonseed Meal.....	Johnson-Hand Co., Ellisville.....
11906	H. G. Cottonseed Meal.....	J. W. Grantham & Sons, Terry.....
11907	H. G. Cottonseed Meal.....	R. H. Green & Bro., Jackson.....
11908	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Meridian.....
11909	H. G. Cottonseed Meal.....	Johnson-Hand Co., Ellisville.....
11910	H. G. Cottonseed Meal.....	Threefoot Bros. & Co., Meridian.....
11911	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Columbus.....
11912	H. G. Cottonseed Meal.....	Hood Milling Co., Gulfport.....
11913	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Clarksdale.....
11914	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Greenville.....
11915	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Grenada.....
11916	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Natchez.....
11917	H. G. Cottonseed Meal.....	J. C. Stokes, Morton.....
11918	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Jackson.....
11919	H. G. Cottonseed Meal.....	D'Lo Merc. Co., D'Lo.....
11920	H. G. Cottonseed Meal.....	Florence Merc. Co., Florence.....
11921	H. G. Cottonseed Meal.....	W. P. Mangum, Braxton.....
11922	H. G. Cottonseed Meal.....	Cox Merc. Co., Braxton.....
11923	H. G. Cottonseed Meal.....	Lampton Rawls Co., Mt. Olive.....
11924	H. G. Cottonseed Meal.....	J. H. McLeod, Hattiesburg.....
11925	H. G. Cottonseed Meal.....	R. S. Dale, Newhebron.....
11926	H. G. Cottonseed Meal.....	W. M. Biglane, Collins.....
11927	H. G. Cottonseed Meal.....	Stuart & Hemiter, Gandisi.....
11928	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Yazoo City.....
11929	H. G. Cottonseed Meal.....	M. M. Moody, Long Beach.....
11930	H. G. Cottonseed Meal.....	Kennedy & Co., Wiggins.....
11931	H. G. Cottonseed Meal.....	W. M. Hyde & Co., Poplarville.....
11932	H. G. Cottonseed Meal.....	W. W. Mitchell, Poplarville.....
11933	H. G. Cottonseed Meal.....	McInnis & Stephenson, Poplarville.....
11934	H. G. Cottonseed Meal.....	Potter Bros., Lumberton.....
11935	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
11936	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
11937	H. G. Cottonseed Meal.....	J. K. Kirkland, Quitman.....
11938	H. G. Cottonseed Meal.....	Hubbard Supply Co., Shuqualak.....
11939	H. G. Cottonseed Meal.....	Sumrall Merc. Co., Sumrall.....
11940	H. G. Cottonseed Meal.....	W. M. Biglane, Collins.....
11941	H. G. Cottonseed Meal.....	J. P. Cox Merc. Co., Braxton.....
11942	H. G. Cottonseed Meal.....	The Cooke Co., Mendenhall.....
11943	H. G. Cottonseed Meal.....	Lampton & Rawles Co., Mt. Olive.....
11944	H. G. Cottonseed Meal.....	Donald Bros., Magee.....
11945	H. G. Cottonseed Meal.....	N. A. Moon & Co., Enterprise.....
11946	H. G. Cottonseed Meal.....	Myer Bros., Meridian.....
11947	H. G. Cottonseed Meal.....	R. L. Simmons, Newton.....
11948	H. G. Cottonseed Meal.....	James O'Connell, Purvis.....
11949	H. G. Cottonseed Meal.....	Threefoot Bros. & Co., Meridian.....
11950	H. G. Cottonseed Meal.....	Ross Bros. & Summer, Pelahatchie.....
11951	H. G. Cottonseed Meal.....	W. J. Brantly, Philadelphia.....
11952	H. G. Cottonseed Meal.....	L. I. Price, Toombsuba.....
11954	H. G. Cottonseed Meal.....	J. K. Dunn, McComb.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11466	8.74	5.88	6.18	7.14	7.50	22.05	23.18
11905	6.23	6.12	6.18	7.43	7.50	22.95	23.18
11906	6.32	6.06	6.18	7.36	7.50	22.73	23.18
11907	5.44	6.15	6.18	7.47	7.50	23.06	23.18
11908	6.61	5.57	6.18	6.76	7.50	20.89	23.18
11909	7.59	6.03	6.18	7.32	7.50	22.61	23.18
11910	6.73	5.45	6.18	6.62	7.50	20.44	23.18
11911	7.60	6.19	6.18	7.51	7.50	23.21	23.18
11912	9.58	5.98	6.18	7.26	7.50	22.43	23.18
11913	6.79	6.27	6.18	7.61	7.50	23.51	23.18
11914	6.52	5.89	6.18	7.15	7.50	22.09	23.18
11915	7.22	6.47	6.18	7.85	7.50	24.26	23.18
11916	9.27	5.69	6.18	6.91	7.50	21.34	23.18
11917	6.84	6.04	6.18	7.33	7.50	22.65	23.18
11918	6.81	5.72	6.18	6.94	7.50	21.45	23.18
11919	7.04	5.93	6.18	7.20	7.50	22.24	23.18
11920	7.26	5.96	6.18	7.24	7.50	22.35	23.18
11921	7.29	5.84	6.18	7.09	7.50	21.90	23.18
11922	6.72	6.37	6.18	7.73	7.50	23.89	23.18
11923	5.71	6.08	6.18	7.38	7.50	22.80	23.18
11924	6.09	5.93	6.18	7.20	7.50	22.24	23.18
11925	7.83	6.17	6.18	7.49	7.50	23.14	23.18
11926	7.74	5.97	6.18	7.25	7.50	22.39	23.18
11927	7.50	5.86	6.18	7.11	7.50	21.98	23.18
11928	8.03	5.78	6.18	7.02	7.50	21.68	23.18
11929	7.99	6.20	6.18	7.53	7.50	23.25	23.18
11930	7.66	5.99	6.18	7.27	7.50	22.46	23.18
11931	7.71	5.77	6.18	7.00	7.50	21.64	23.18
11932	8.34	6.24	6.18	7.58	7.50	23.40	23.18
11933	6.78	6.06	6.18	7.36	7.50	22.73	23.18
11934	8.65	6.33	6.18	7.68	7.50	23.74	23.18
11935	6.98	5.94	6.18	7.21	7.50	22.28	23.18
11936	9.11	6.21	6.18	7.54	7.50	23.29	23.18
11937	7.30	5.92	6.18	7.19	7.50	22.20	23.18
11938	7.78	6.03	6.18	7.32	7.50	22.61	23.18
11939	7.87	5.66	6.18	6.87	7.50	21.23	23.18
11940	7.08	5.75	6.18	6.98	7.50	21.56	23.18
11941	7.34	6.07	6.18	7.37	7.50	22.76	23.18
11942	7.03	5.70	6.18	6.92	7.50	21.38	23.18
11943	7.43	5.59	6.18	6.79	7.50	20.96	23.18
11944	7.15	6.03	6.18	7.32	7.50	22.61	23.18
11945	7.35	5.39	6.18	6.54	7.50	20.21	23.18
11946	7.64	6.18	6.18	7.50	7.50	23.18	23.18
11947	6.81	5.91	6.18	7.17	7.50	22.16	23.18
11948	7.68	5.95	6.18	7.22	7.50	22.31	23.18
11949	7.88	5.95	6.18	7.22	7.50	22.31	23.18
11950	7.51	5.90	6.18	7.16	7.50	22.13	23.18
11951	8.06	5.76	6.18	6.99	7.50	21.60	23.18
11952	7.86	6.06	6.18	7.36	7.50	22.73	23.18
11954	7.41	5.85	6.18	7.10	7.50	21.94	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
11955	H. G. Cottonseed Meal.....	Biloxi Milling Co., Biloxi
11956	H. G. Cottonseed Meal.....	T. J. Cotton, Summit.....
11957	H. G. Cottonseed Meal.....	W. C. Seale & Co., Roxie.....
11958	H. G. Cottonseed Meal.....	Centreville Merc. Co., Centreville.....
11959	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Natchez.....
11953	S. G. Cottonseed Meal	Gulfport Grocery Co., Gulfport.....
	MOORHEAD OIL COMPANY, Moorhead, Miss.	
11467	H. G. Cottonseed Meal.....	Moorhead Oil Co., Moorhead.....
11468	H. G. Cottonseed Meal.....	Moorhead Oil Co., Moorhead.....
11960	H. G. Cottonseed Meal.....	Moorhead Oil Co., Moorhead.....
	NATCHEZ OIL COMPANY, Natchez, Miss.	
11469	H. G. Cottonseed Meal.....	R. F. Walden & Co., Prentiss.....
11470	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
11961	H. G. Cottonseed Meal.....	The Bay Grain Co., Bay St. Louis.....
11962	H. G. Cottonseed Meal.....	Caldwell Bros., Ellisville.....
11963	H. G. Cottonseed Meal.....	R. F. Walden & Co., Prentiss.....
11964	H. G. Cottonseed Meal.....	J. K. Henley, Biloxi.....
11965	H. G. Cottonseed Meal.....	Natchez Oil Co., Natchez.....
	NEWTON OIL & M'F'G. CO., Newton, Miss.	
11471	H. G. Cottonseed Meal.....	M. A. Metts, Louisville.....
11472	H. G. Cottonseed Meal.....	Farmers' Union Wse. Co., Forest.....
11473	H. G. Cottonseed Meal.....	Stevens & Ruffin, New Augusta.....
11474	H. G. Cottonseed Meal.....	J. L. Royals, Louin.....
11475	H. G. Cottonseed Meal.....	Riverside Commercial Co., Leaf.....
11476	H. G. Cottonseed Meal.....	Newton Oil & M'f'g. Co., Newton.....
11966	H. G. Cottonseed Meal.....	F. L. White, Philadelphia.....
11967	H. G. Cottonseed Meal.....	F. R. Holloway & Co., Richton.....
11968	H. G. Cottonseed Meal.....	Jeff Griffis Merc. Co., Beaumont.....
11969	H. G. Cottonseed Meal.....	M. A. Metts, Louisville.....
11970	H. G. Cottonseed Meal.....	Z. T. Harrison, Hickory.....
	NORTH MISS. OIL MILLS, Holly Springs, Miss.	
11477	H. G. Cottonseed Meal.....	North Miss. Oil Mills, Holly Springs.....
11478	H. G. Cottonseed Meal.....	North Miss. Oil Mills, Holly Springs.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11955	7.06	6.10	6.18	7.41	7.50	22.88	23.18
11956	6.40	6.02	6.18	7.31	7.50	22.58	23.18
11957	8.59	6.15	6.18	7.47	7.50	23.06	23.18
11958	8.10	5.72	6.18	6.94	7.50	21.45	23.18
11959	9.74	5.61	6.18	6.81	7.50	21.04	23.18
11953	7.25	5.12	4.95	6.22	6.01	19.20	18.56
11467	5.89	6.48	6.18	7.87	7.50	24.30	23.18
11468	7.75	6.46	6.18	7.84	7.50	24.23	23.18
11960	6.10	6.43	6.18	7.81	7.50	24.11	23.18
11469	7.81	6.14	6.18	7.45	7.50	23.03	23.18
11470	7.72	6.07	6.18	7.37	7.50	22.76	23.18
11961	7.12	6.90	6.18	7.16	7.50	22.13	23.18
11962	6.96	6.12	6.18	7.43	7.50	22.95	23.18
11963	7.14	6.10	6.18	7.41	7.50	22.88	23.18
11964	7.12	5.94	6.18	7.21	7.50	22.28	23.18
11965	6.83	6.05	6.18	7.34	7.50	22.69	23.18
11471	7.80	6.39	6.18	7.76	7.50	23.96	23.18
11472	7.82	6.64	6.18	8.06	7.50	24.90	23.18
11473	8.64	6.07	6.18	7.37	7.50	22.76	23.18
11474	8.89	5.97	6.18	7.25	7.50	22.39	23.18
11475	7.96	6.39	6.18	7.76	7.50	23.96	23.18
11476	6.75	6.66	6.18	8.09	7.50	24.98	23.18
11966	7.18	6.18	6.18	7.50	7.50	23.18	23.18
11967	6.44	6.25	6.18	7.59	7.50	23.44	23.18
11968	6.36	6.25	6.18	7.59	7.50	23.44	23.18
11969	7.78	6.21	6.18	7.54	7.50	23.29	23.18
11970	7.49	6.25	6.18	7.59	7.50	23.44	23.18
11477	5.22	7.24	6.18	8.79	7.50	27.15	23.18
11478	7.84	6.16	6.18	7.48	7.50	23.10	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	OKOLONA OIL COMPANY, Okolona, Miss.	
11479	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
11480	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
11971	H. G. Cottonseed Meal.....	P. W. McMorris, Brooksville.....
	OXFORD OIL MILL COMPANY, Oxford, Miss.	
11481	S. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
11482	S. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
11972	S. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
	PEOPLES COTTON OIL & FIBER COMPANY, North Carrollton, Miss.	
11483	S. G. Cottonseed Meal.....	Peoples Cotton Oil & Fibre Co., North Carrollton.....
11484	S. G. Cottonseed Meal.....	Peoples Cotton Oil & Fibre Co., North Carrollton.....
11973	S. G. Cottonseed Meal.....	Peoples Cotton Oil & Fibre Co., North Carrollton.....
	PEOPLES OIL MILL & FERT. WORKS, Aberdeen, Miss.	
11485	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Wks., Aberdeen
11486	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Wks., Aberdeen
11974	H. G. Cottonseed Meal.....	W. T. Ware, Aberdeen.....
11975	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Wks., Aberdeen
	PHOENIX COTTON OIL CO., Como, Miss.	
11487	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
11488	H. G. Cottonseed Meal.....	Phil Pointer & Co., Como.....
11976	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
	PICKENS COTTON OIL CO., Pickens, Miss.	
11489	S. G. Cottonseed Meal.....	Pickens Cotton Oil Co., Pickens.....
11490	S. G. Cottonseed Meal.....	Pickens Cotton Oil Co., Pickens.....
11977	S. G. Cottonseed Meal.....	Pickens Cotton Oil Co., Pickens.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11479	8.28	6.74	6.18	8.18	7.50	25.28	23.18
11480	8.30	6.92	6.18	8.40	7.50	25.95	23.18
11971	7.04	6.82	6.18	8.28	7.50	25.58	23.18
11481	8.82	6.29	4.95	7.64	6.01	23.59	18.56
11482	7.25	5.35	4.95	6.49	6.01	20.06	18.56
11972	5.78	6.50	4.95	7.89	6.01	24.38	18.56
11483	8.10	5.24	5.40	6.36	6.56	19.65	20.25
11484	8.00	5.58	5.40	6.77	6.56	20.93	20.25
11973	7.56	5.62	5.40	6.82	6.56	21.08	20.25
11485	7.90	7.00	6.18	8.50	7.50	26.25	23.18
11486	6.79	6.89	6.18	8.36	7.50	25.84	23.18
11974	7.03	6.73	6.18	8.17	7.50	25.24	23.18
11975	6.75	6.59	6.18	8.00	7.50	24.71	23.18
11487	8.45	6.83	6.18	8.29	7.50	25.61	23.18
11488	7.14	6.84	6.18	8.30	7.50	25.65	23.18
11976	6.70	6.56	6.18	7.96	7.50	24.60	23.18
11489	8.68	5.94	4.95	7.21	6.01	22.28	18.56
11490	8.83	5.07	4.95	6.15	6.01	19.01	18.56
11977	7.92	5.93	4.95	7.20	6.01	22.24	18.56

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
PLANTERS GIN & OIL COMPANY, Baldwyn, Miss.		
11491	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....
11492	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....
11978	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....
PLANTERS OIL MILL & GIN CO., Kosciusko, Miss.		
11493	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko.....
11494	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko.....
11979	H. G. Cottonseed Meal.....	W. B. Potts & Sons, Kosciusko.....
11980	H. G. Cottonseed Meal.....	Jackson & Wallace Co., Kosciusko.....
11981	H. G. Cottonseed Meal.....	O. L. Shaw Ackerman.....
PLANTERS OIL MILL & M'F'G. COMPANY, Greenwood, Miss.		
11495	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., G'wood.....
11496	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., G'wood.....
11982	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., G'wood.....
11983	H. G. Cottonseed Meal.....	C. F. Nelson & Son, Goodman.....
PLANTERS OIL MILL, Tunica, Miss.		
11497	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
11498	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
11984	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
11985	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
PLANTERS OIL WORKS, Clarksdale, Miss.		
11499	S. G. Cottonseed Meal.....	Planters Oil Works, Clarksdale.....
11500	S. G. Cottonseed Meal.....	Planters Oil Works, Clarksdale.....
11986	S. G. Cottonseed Meal.....	Planters Oil Works, Clarksdale.....
PONTOTOC COTTON OIL CO., Pontotoc, Miss.		
11501	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc.....
11502	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc.....
11987	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen Found.	Ammonia—equivalent of Nitrogen Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11491	8.35	6.57	6.18	7.98	7.50	24.64	23.18
11492	8.15	6.65	6.18	8.07	7.50	24.94	23.18
11978	7.90	6.77	6.18	8.22	7.50	25.39	23.18
11493	8.35	6.22	6.18	7.55	7.50	23.33	23.18
11494	6.46	6.32	6.18	7.67	7.50	23.70	23.18
11979	7.52	6.33	6.18	7.68	7.50	23.74	23.18
11980	7.45	6.35	6.18	7.71	7.50	23.81	23.18
11981	8.92	5.86	6.18	7.11	7.50	21.98	23.18
11495	8.13	6.23	6.18	7.56	7.50	23.36	23.18
11496	9.57	5.64	6.18	6.85	7.50	21.15	23.18
11982	6.81	5.98	6.18	7.26	7.50	22.43	23.18
11983	6.89	6.38	6.18	7.75	7.50	23.93	23.18
11497	7.09	6.62	6.50	8.04	7.89	24.83	24.38
11498	8.64	6.17	6.50	7.49	7.89	23.14	24.38
11984	6.11	6.48	6.50	7.87	7.89	24.30	24.38
11985	7.10	6.28	6.50	7.62	7.89	23.55	24.38
11499	6.98	6.46	5.00	7.84	6.07	24.23	18.75
11500	8.04	6.42	5.00	7.79	6.07	24.08	18.75
11986	7.24	6.13	5.00	7.44	6.07	22.99	18.75
11501	7.04	6.96	6.18	8.45	7.50	26.10	23.18
11502	7.85	7.09	6.18	8.61	7.50	26.59	23.18
11987	7.20	7.02	6.18	8.52	7.50	26.33	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
PORT GIBSON OIL WORKS, Port Gibson, Miss.		
10027	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10028	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10029	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10961	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10963	S. G. Cottonseed Meal	McLean & Ratcliff, Gloster
10964	S. G. Cottonseed Meal	Griffin & Allen, Hamburg
10965	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10966	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
10967	S. G. Cottonseed Meal	S. Bernheimer & Son, Port Gibson
11503	S. G. Cottonseed Meal	Mutual Merc. Co., Utica
11504	S. G. Cottonseed Meal	C. J. Edwards Co., Vicksburg
PRODUCERS COTTON OIL CO., Yazoo City, Miss.		
11505	H. G. Cottonseed Meal	Donald Bros., Magee
11506	H. G. Cottonseed Meal	J. K. Dunn, McComb
11988	H. G. Cottonseed Meal	J. K. Dunn, McComb
11989	H. G. Cottonseed Meal	Producers Cotton Oil Co., Yazoo City
REFUGE COTTON OIL COMPANY, Columbus, Miss.		
11507	H. G. Cottonseed Meal	L. C. Smith, Lauderdale
11508	H. G. Cottonseed Meal	Refuge Cotton Oil Co., Columbus
11990	H. G. Cottonseed Meal	Refuge Cotton Oil Co., Columbus
REFUGE COTTON OIL COMPANY, Vicksburg, Miss.		
11509	S. G. Cottonseed Meal	Haynes & Hood, Vicksburg
11510	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Greenville
11991	S. G. Cottonseed Meal	Haynes & Hood, Vicksburg
11992	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Rosedale
11993	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Greenville
RODNEY GIN & OIL MILL, Rodney, Miss.		
11511	H. G. Cottonseed Meal	Rodney Gin & Oil Mill, Rodney
ROLLING FORK OIL COMPANY, Rolling Fork, Miss.		
11512	S. G. Cottonseed Meal	Rolling Fork Oil Co., Rolling Fork
11513	S. G. Cottonseed Meal	Rolling Fork Oil Co., Rolling Fork

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
10027	5.85	5.77	5.00	7.00	6.07	21.64	18.75
10028	6.33	5.56	5.00	6.75	6.07	20.85	18.75
10029	6.44	6.17	5.00	7.49	6.07	23.14	18.75
10961	5.71	5.77	5.00	7.00	6.07	21.64	18.75
10963	7.00	5.64	5.00	6.85	6.07	21.15	18.75
10964	6.64	5.59	5.00	6.79	6.07	20.96	18.75
10965	5.75	5.70	5.00	6.92	6.07	21.38	18.75
10966	6.05	5.74	5.00	6.97	6.07	21.53	18.75
10967	5.69	5.67	5.00	6.88	6.07	21.26	18.75
11503	8.57	5.72	5.00	6.94	6.07	21.45	18.75
11504	7.76	5.63	5.00	6.83	6.07	21.11	18.75
11505	7.60	6.20	6.18	7.53	7.50	23.25	23.18
11506	8.10	6.13	6.18	7.44	7.50	22.99	23.18
11988	7.74	6.23	6.18	7.56	7.50	23.36	23.18
11989	7.04	5.98	6.18	7.26	7.50	22.43	23.18
11507	7.74	6.03	6.18	7.32	7.50	22.61	23.18
11508	7.54	6.46	6.18	7.84	7.50	24.23	23.18
11990	7.07	6.39	6.18	7.76	7.50	23.96	23.18
11509	6.77	5.47	4.95	6.64	6.01	20.51	18.56
11510	7.59	5.99	4.95	7.27	6.01	22.46	18.56
11991	7.21	5.39	4.95	6.54	6.01	20.21	18.56
11992	6.92	5.84	4.95	7.09	6.01	21.90	18.56
11993	7.21	5.84	4.95	7.09	6.01	21.90	18.56
11511	8.76	6.32	6.18	7.67	7.50	23.70	23.18
11512	5.39	5.93	6.00	7.20	7.28	22.24	22.50
11513	7.16	6.45	6.00	7.83	7.28	24.19	22.50

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	SARDIS OIL COMPANY, Sardis, Miss.	
11514	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
11515	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
11994	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
11995	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
	SENATOBIA OIL COMPANY, Senatobia, Miss.	
11516	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
11517	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
11996	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
11997	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
	SHAW COTTON OIL COMPANY, Shaw, Miss.	
11518	S. G. Cottonseed Meal	Caldwell Bros., Ellisville.....
11519	S. G. Cottonseed Meal	Hattiesburg Grocery Co., Hattiesburg
11998	S. G. Cottonseed Meal	Hattiesburg Grocery Co., Hattiesburg
	SHELBY COTTON OIL COMPANY, Shelby, Miss.	
11520	H. G. Cottonseed Meal.....	Shelby Cotton Oil Co., Shelby.....
11521	H. G. Cottonseed Meal.....	Shelby Cotton Oil Co., Shelby.....
11999	H. G. Cottonseed Meal.....	Shelby Cotton Oil Co., Shelby.....
	SHUBUTA OIL & M'F'G. CO., Shubuta, Miss.	
11522	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
11523	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
12000	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
	SOUTHERN OIL & FERT. CO., Meridian, Miss.	
11524	H. G. Cottonseed Meal.....	Cleveland Bros., Union.....
11525	H. G. Cottonseed Meal.....	B. R. Brown, Lockhart.....
11526	H. G. Cottonseed Meal.....	W. W. Mitchell, Poplarville.....
11527	H. G. Cottonseed Meal.....	Jones County Farmers' Union Ware- house Co., Ellisville.....
11528	H. G. Cottonseed Meal.....	Morton Farmers Wse. Co., Morton....
11529	H. G. Cottonseed Meal.....	Morgan & Smiley, Heidelberg.....
12001	H. G. Cottonseed Meal.....	T. F. Abney, Montrose.....
12002	H. G. Cottonseed Meal.....	John L. Platt, Lake.....
12003	H. G. Cottonseed Meal.....	Miss. & Ala. Co-Operative Co., State Line.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11514	4.82	6.33	6.20	7.68	7.53	23.74	23.25
11515	5.68	6.48	6.20	7.87	7.53	24.30	23.25
11994	5.36	6.57	6.20	7.98	7.53	24.64	23.25
11995	5.58	6.36	6.20	7.72	7.53	23.85	23.25
11516	7.41	6.79	6.18	8.24	7.50	25.46	23.18
11517	7.86	6.51	6.18	7.90	7.50	24.41	23.18
11996	4.88	6.66	6.18	8.09	7.50	24.98	23.18
11997	8.06	6.67	6.18	8.10	7.50	25.01	23.18
11518	7.51	5.78	4.95	7.02	6.01	21.68	18.56
11519	7.00	5.99	4.95	7.27	6.01	22.46	18.56
11998	7.72	5.87	4.95	7.13	6.01	22.01	18.56
11520	7.19	5.74	6.18	6.97	7.50	21.53	23.18
11521	6.75	6.65	6.18	8.07	7.50	24.94	23.18
11999	7.33	6.31	6.18	7.66	7.50	23.66	23.18
11522	7.58	6.78	6.18	8.23	7.50	25.43	23.18
11523	7.85	6.61	6.18	8.02	7.50	24.79	23.18
12000	6.08	6.53	6.18	7.93	7.50	24.49	23.18
11524	7.62	6.18	6.18	7.50	7.50	23.18	23.18
11525	8.68	6.42	6.18	7.79	7.50	24.08	23.18
11526	8.48	6.28	6.18	7.62	7.50	23.55	23.18
11527	7.63	6.55	6.18	7.95	7.50	24.56	23.18
11528	8.74	6.34	6.18	7.70	7.50	23.78	23.18
11529	7.62	6.40	6.18	7.77	7.50	24.00	23.18
12001	5.72	6.60	6.18	8.01	7.50	24.75	23.18
12002	8.40	6.10	6.18	7.41	7.50	22.88	23.18
12003	6.62	6.21	6.18	7.54	7.50	23.29	23.18

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	SULLIGENT COTTON OIL CO., Sulligent, Ala.	
11530	H. G. Cottonseed Meal.....	J. A. Mayfield, Amory.....
	TENNESSEE COTTON OIL CO., Memphis, Tenn.	
11531	H. G. Cottonseed Meal.....	Phillips, Reinhart Taylor Co., Booneville
11532	H. G. Cottonseed Meal.....	C. M. Elder, New Albany.....
12004	H. G. Cottonseed Meal.....	F. S. Leavell, Oxford.....
12005	H. G. Cottonseed Meal.....	Barnett Supply Co., Booneville.....
	TENNESSEE FIBRE COMPANY, Memphis, Tenn.	
11533	O. G. Creamo Brand Cotton- seed Meal	Hood Milling Co., Gulfport.....
11534	O. G. Creamo Brand Cotton- seed Meal	Reed Mimms, Ellisville.....
11535	O. G. Creamo Brand Cotton- seed Meal	Union Naval Stores, Gulfport.....
12006	O. G. Creamo Brand Cotton- seed Meal	Union Naval Stores, Gulfport.....
12007	O. G. Creamo Brand Cotton- seed Meal	Hood Bros., Gulfport
12008	O. G. Creamo Brand Cotton- seed Meal	Buckley-Terry Co., Laurel.....
12009	O. G. Creamo Brand Cotton- seed Meal	The Hall Co., Laurel.....
12010	O. G. Creamo Brand Cotton- seed Meal	Threefoot Bros. & Co., Meridian.....
12011	O. G. Creamo Brand Cotton- seed Meal	A. J. Lyons & Co., Meridian.....
12012	O. G. Creamo Brand Cotton- seed Meal	Premium Merc. Co., Merrill.....
12013	O. G. Creamo Brand Cotton- seed Meal	Croom & Story, Lucedale.....
12014	O. G. Creamo Brand Cotton- seed Meal	C. W. McKnight, Iuka.....
12015	O. G. Creamo Brand Cotton- seed Meal	Gilmore May & Co., Amory.....
	C. A. TINDALL & COMPANY, Memphis, Tenn.	
11536	O. G. Superior Cottonseed Meal	T. C. Ruble, McHenry.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equiva- lent of Nitrogen— Found.	Ammonia—equiva- lent of Nitrogen— Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11530	8.50	6.81	6.29	8.27	7.64	25.54	23.59
11531	9.57	6.32	6.18	7.67	7.50	23.70	23.18
11532	8.25	6.18	6.18	7.50	7.50	23.18	23.18
12004	6.92	6.00	6.18	7.28	7.50	22.50	23.18
12005	7.35	5.15	6.18	6.25	7.50	19.31	23.18
11533	9.21	3.37	3.50	4.09	4.25	12.64	13.13
11534	9.14	3.28	3.50	3.98	4.25	12.30	13.13
11535	9.07	2.99	3.50	3.63	4.25	11.21	13.13
12006	7.18	3.11	3.50	3.78	4.25	11.66	13.13
12007	8.97	3.34	3.50	4.05	4.25	12.53	13.13
12008	8.52	3.08	3.50	3.74	4.25	11.55	13.13
12009	8.01	2.95	3.50	3.58	4.25	11.06	13.13
12010	7.77	3.13	3.50	3.80	4.25	11.74	13.13
12011	8.31	2.84	3.50	3.45	4.25	10.65	13.13
12012	5.90	3.52	3.50	4.27	4.25	13.20	13.13
12013	7.76	3.15	3.50	3.82	4.25	11.81	13.13
12014	5.98	3.45	3.50	4.19	4.25	12.94	13.13
12015	7.07	2.68	3.50	3.25	4.25	10.05	13.13
11536	9.26	3.97	3.52	4.82	4.27	14.89	13.20

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	
11537	H. G. Cottonseed Meal.....	J. H. Holloway, Saltillo.....
11538	H. G. Cottonseed Meal.....	J. R. Clayton, Guntown.....
12016	H. G. Cottonseed Meal.....	Tupelo Oil & Ice Co., Tupelo.....
	VICKSBURG COTTON OIL CO., Vicksburg, Miss.	
11539	H. G. Cottonseed Meal.....	W. M. Conner, Hattiesburg.....
11540	H. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg.....
12017	H. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg.....
12018	H. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg.....
11541	S. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg.....
11542	S. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg.....
	WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss.	
11543	H. G. Cottonseed Meal.....	J. R. Gallaspy, Crystal Springs.....
11544	H. G. Cottonseed Meal.....	Hyman Merc. Co., Summit.....
11545	H. G. Cottonseed Meal.....	J. F. Armstrong, Sontag.....
12019	H. G. Cottonseed Meal.....	W. L. Robinson Co., Liberty.....
12020	H. G. Cottonseed Meal.....	J. R. Gallaspy, Crystal Springs.....
	WINONA OIL & M'F'G. CO., Winona, Miss.	
11546	H. G. Cottonseed Meal.....	Wilson & Boyd, Kilmichael.....
11547	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
12021	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
12022	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
12023	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
	WOODVILLE OIL & M'F'G. CO., Woodville, Miss.	
11548	H. G. Cottonseed Meal.....	Woodville Oil & M'f'g. Co., Woodville.....
11549	H. G. Cottonseed Meal.....	Woodville Oil & M'f'g. Co., Woodville.....

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
11537	8.65	6.34	6.60	7.70	8.01	23.78	24.75
11538	7.47	6.84	6.60	8.30	8.01	25.65	24.75
12016	5.28	6.59	6.60	8.00	8.01	24.71	24.75
11539	7.73	5.46	6.18	6.63	7.50	20.48	23.18
11540	8.90	5.63	6.18	6.83	7.50	21.11	23.18
12017	6.22	6.21	6.18	7.54	7.50	23.29	23.18
12018	9.19	6.39	6.18	7.76	7.50	23.96	23.18
11541	8.91	4.68	5.00	5.68	6.07	17.55	18.75
11542	8.90	5.02	5.00	6.09	6.07	18.83	18.75
11543	7.12	6.27	6.18	7.61	7.50	23.51	23.18
11544	9.17	6.19	6.18	7.51	7.50	23.21	23.18
11545	7.61	6.34	6.18	7.70	7.50	23.78	23.18
12019	6.87	7.00	6.18	8.50	7.50	26.25	23.18
12020	7.75	6.84	6.18	8.30	7.50	25.65	23.18
11546	6.86	6.94	6.18	8.43	7.50	26.03	23.18
11547	6.57	6.43	6.18	7.81	7.50	24.11	23.18
12021	6.93	7.07	6.18	8.58	7.50	26.51	23.18
12022	5.71	6.89	6.18	8.36	7.50	25.84	23.18
12023	6.51	7.23	6.18	8.78	7.50	27.11	23.18
11548	5.32	6.03	6.18	7.32	7.50	22.61	23.18
11549	7.10	6.26	6.18	7.60	7.50	23.48	23.18

Mississippi Agricultural Experiment Station
Agricultural College, Mississippi.

BULLETIN No. 128.

INSPECTION AND ANALYSES
OF COTTONSEED MEAL
ON SALE IN THE STATE



CHEMICAL LABORATORY.

AGRICULTURAL COLLEGE, MISSISSIPPI

APRIL, 1910.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.

Inspection and Analyses of Cottonseed Meal

BY THE CHEMICAL DEPARTMENT OF THE
Mississippi Agricultural and Mechanical College.

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INSPECTION AND ANALYSES

—OF—

COTTONSEED MEAL.

Season 1909-1910.



Introduction.—This bulletin contains two tables of analyses as follows:

TABLE I—Analyses of samples of cotton-seed meal drawn by regular inspectors;

TABLE II—Analyses of samples received from the oil mills.

An additional bulletin will be issued before the close of the season on October first. Prompt attention will be given requests of dealers and farmers for analyses of special samples, and a careful inspection will be maintained throughout the season.

General results of the inspection.—The tables contain analyses of 223 samples, though only 137 of these represent actual shipments found on sale, the remainder being samples received from manufacturers.

An inspection of Table I will show that manufacturers have usually supplied their trade with meal equal in quality to that guaranteed. While 28 of the 137 samples analyzed are deficient in nitrogen, the deficiencies are slight in most cases. Only 5.8% of the samples examined are below guarantee in nitrogen, to the extent of 5% of the amount guaranteed, and only four samples out of the entire number are 10% deficient. The inspection shows that managers of mills are maintaining a careful supervision of the manufacturing processes.

Legal grades of meal.—Purchasers of meal should always inspect the guarantee on the bags before buying, since meal of any quality may be marketed legally in this state.

**High Grade meal must contain at least 6.18% of nitrogen;
Standard Grade meal must contain at least 4.95% nitrogen;
Off Grade meal contains less than 4.95% nitrogen.**

The laws of some states prohibit altogether the sale of meal of inferior quality, and, since this is not the case in Mississippi, the buyer must always specify the grade of meal.

Comparative Values.—It is certainly the duty of reputable dealers to explain to their customers the marked difference in value which may exist between the various grades of meal on the market. Meal is bought and used most largely for the **nitrogen** which it contains.

Using the percentage of nitrogen alone as a basis of approximate comparison of the actual relative values of different grades of meal, and, assuming that meal containing, say, 6.50 per cent of nitrogen can be obtained for \$30.00 a ton, the approximate comparative values of the lower grades (i. e., those containing more hulls) is shown by the following statement:

Meal containing 6.50% of nitrogen.....	\$30.00 per ton.
Meal containing 6.40% of nitrogen.....	29.54 per ton.
Meal containing 6.30% of nitrogen.....	29.10 per ton.
Meal containing 6.20% of nitrogen.....	28.64 per ton.
Meal containing 6.00% of nitrogen.....	27.72 per ton.
Meal containing 5.80% of nitrogen.....	26.79 per ton.
Meal containing 5.50% of nitrogen.....	25.41 per ton.
Meal containing 5.25% of nitrogen.....	24.25 per ton.
Meal containing 5.00% of nitrogen.....	23.10 per ton.
Meal containing 3.50% of nitrogen.....	16.17 per ton.

Purchasers should remember that the best meal is usually the cheapest also.

Especial attention should be directed to the difference in selling price which should exist between **High Grade** and **Standard Grade** meal. It is not sufficient to conclude that an arbitrary difference in price, say, of one or two dollars per ton is an approximate measure of the **actual** difference in value to the buyer. The foregoing table shows that this is not the case. If we assume that the meal usually sold as high grade contains, say, 6.50% of nitrogen and sells for \$30.00 per ton, and standard grade meal, say, 5.50% of nitrogen, their relative values will be as follows:

High Grade Meal.....	\$30.00 per ton.
Standard Grade Meal.....	25.38 per ton.
Difference in value.....	\$ 4.62 per ton.

Relative Values.—The relative values given in this bulletin are based on nitrogen content only. The Mississippi law does not require sellers to guarantee definite amounts of potash and phosphoric acid. The comparative values given here are obtained by multiplying the percentage of nitrogen by 4.50.

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ABERDEEN OIL & ICE CO., Aberdeen, Miss.	
12519	H. G. Cottonseed Meal	Aberdeen Oil & Ice Co., Aberdeen.....
	ALCORN COTTON OIL CO., Corinth, Miss.	
12518	H. G. Cottonseed Meal.....	C. A. Turner, Corinth.....
12520	H. G. Cottonseed Meal.....	Alcorn Cotton Oil Co., Corinth.....
	ANGUILLA OIL & GIN COMPANY, Anguilla, Miss.	
12521	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
	ARCOLA OIL MILL, Arcola, Miss.	
12522	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola.....
	BARBER & LEWIS OIL CO., Edwards, Miss.	
12523	H. G. Cottonseed Meal.....	Biloxi Milling Co., Biloxi.....
12524	H. G. Cottonseed Meal.....	M. M. Moody, Long Beach.....
12525	H. G. Cottonseed Meal.....	Hood Milling Co., Gulfport.....
12526	H. G. Cottonseed Meal.....	Barber & Lewis Oil Co., Edwards.....
12527	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg
	BROOKHAVEN COTTON OIL & FERT. COMPANY, Brookhaven, Miss.	
12528	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg
12529	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg
12530	H. G. Cottonseed Meal.....	L. L. Anding, Wesson.....
12531	S. G. Cottonseed Meal	B'haven Cotton Oil & Fert. Co., B'h'v'n
12532	S. G. Cottonseed Meal	B'haven Cotton Oil & Fert Co., B'h'v'n.
	BUCKEYE COTTON OIL CO., Jackson, Miss.	
12533	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
12534	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood...
12535	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Jackson.....
12536	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
12537	H. G. Cottonseed Meal.....	Buckley-Terry Co., Laurel.....
12538	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Jackson.....
12539	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12519	5.55	6.78	6.18	8.24	7.51	30.51	27.81
12518	7.75	7.04	6.18	8.56	7.51	31.68	27.81
12520	7.18	7.10	6.18	8.63	7.51	31.95	27.81
12521	4.33	6.45	6.18	7.84	7.51	29.03	27.81
12522	7.23	6.74	6.18	8.19	7.51	30.33	27.81
12523	7.99	5.72	6.18	6.95	7.51	25.74	27.81
12524	6.09	6.16	6.18	7.49	7.51	27.72	27.81
12525	6.28	6.26	6.18	7.61	7.51	28.17	27.81
12526	6.07	6.15	6.18	7.48	7.51	27.68	27.81
12527	6.51	6.34	6.18	7.71	7.51	28.53	27.81
12528	6.14	6.14	6.20	7.47	7.54	27.63	27.90
12529	6.58	5.49	6.20	6.67	7.54	24.71	27.90
12530	6.04	5.55	6.20	6.75	7.54	24.98	27.90
12531	6.25	5.71	4.95	6.94	6.02	25.70	22.28
12532	6.27	5.23	4.95	6.36	6.02	23.54	22.28
12533	7.20	6.50	6.18	7.90	7.51	29.25	27.81
12534	6.01	6.09	6.18	7.40	7.51	27.41	27.81
12535	6.86	5.59	6.18	6.80	7.51	25.15	27.81
12536	6.15	6.38	6.18	7.76	7.51	28.71	27.81
12537	7.93	6.10	6.18	7.42	7.51	27.45	27.81
12538	8.62	6.30	6.18	7.66	7.51	28.35	27.81
12539	7.82	6.20	6.18	7.54	7.51	27.90	27.81

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	BUTLER-KEYSER OIL & FERT. COMPANY, Fayette, Miss.	
12540	H. G. Cottonseed Meal.....	Butler-Kyser Oil & Fert. Co., Fayette
12541	H. G. Cottonseed Meal.....	Butler-Kyser Oil & Fert. Co., Fayette
	CANTON OIL MILL COMPANY, Canton, Miss.	
12542	H. G. Cottonseed Meal.....	Canton Oil Mill Co., Canton.....
	CENTRAL COTTON OIL COMPANY Jackson, Miss.	
12543	H. G. Cottonseed Meal.....	Central Cotton Oil Co., Jackson.....
12544	H. G. Cottonseed Meal.....	Central Cotton Oil Co., Jackson.....
	CENTREVILLE COTTON OIL CO., Centreville, Miss.	
12545	S. G. Cottonseed Meal	Centreville Cotton Oil Co., Centreville
12546	S. G. Cottonseed Meal	Centreville Cotton Oil Co., Centreville
	* CLAY COUNTY COTTON OIL COMPANY, West Point, Miss.	
12547	S. G. Cottonseed Meal	Clay County Cotton Oil Co., West Point
12441	S. G. Cottonseed Meal	J. L. Dudley, Scooba.....
12442	S. G. Cottonseed Meal	J. W. Dew, Wahalak.....
12435	S. G. Cottonseed Meal	McCool Mercantile Co., McCool.....
12438	S. G. Cottonseed Meal	E. F. Nunn & Co., Shuqualak.....
12440	S. G. Cottonseed Meal	D. A. Morrison, Scooba.....
12503	S. G. Cottonseed Meal	T. H. Giles, Wahalak.....
12504	S. G. Cottonseed Meal	Saltillo Gin Co., Saltillo
12505	S. G. Cottonseed Meal	L. A. Sanderson, Vardaman.....
12506	S. G. Cottonseed Meal	D. F. Holland, Maben.....
14226	H. G. Cottonseed Meal	Clay County Cotton Oil Co., West P't.
14227	H. G. Cottonseed Meal.....	L. A. Sanderson, Vardaman.....
14228	H. G. Cottonseed Meal.....	E. F. Nun & Co., Shuqualak.....

* The Clay County Cotton Oil Co. manufactured very little Standard Grade meal. In making changes in machinery, they discovered that some meal lower than 6.18% nitrogen had been made unintentionally. They immediately sent a representative to explain this to the Department and Special Inspectors were sent out at their request to draw samples from shipments. The Company supplied a list of all shipments in question and no purchaser will suffer on account of the shipment of standard grade for high grade meal. The manufacturer should be commended for their prompt action in voluntarily protecting their trade to the fullest extent.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12540	6.99	6.52	6.18	7.93	7.51	29.34	27.81
12541	7.15	6.49	6.18	7.89	7.51	29.21	27.81
12542	6.18	6.74	6.18	8.19	7.51	30.33	27.81
12543	5.59	7.11	6.18	8.64	7.51	32.00	27.81
12544	7.15	6.36	6.18	7.73	7.51	28.62	27.81
12545	5.77	6.43	5.00	7.82	6.08	28.94	22.50
12546	7.36	6.58	5.00	8.00	6.08	29.61	22.50
12547	6.60	5.82	4.95	7.08	6.02	26.19	22.28
12441	6.97	5.56	4.95	6.76	6.02	25.02	22.28
12442	7.54	5.88	4.95	7.15	6.02	26.46	22.28
12435	8.07	5.71	4.95	6.94	6.02	25.70	22.28
12438	6.52	5.12	4.95	6.22	6.02	23.04	22.28
12440	6.02	5.05	4.95	6.14	6.02	22.73	22.28
12503	7.39	5.94	4.95	7.22	6.02	26.73	22.28
12504	7.84	6.07	4.95	7.38	6.02	27.32	22.28
12505	7.30	6.03	4.95	7.33	6.02	27.14	22.28
12506	6.79	5.80	4.95	7.05	6.02	26.10	22.28
14226	9.05	6.44	6.18	7.83	7.51	28.98	27.81
14227	8.23	6.84	6.18	8.32	7.51	30.78	27.81
14228	9.73	6.58	6.18	8.00	7.51	29.61	27.81

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	COLDWATER COTTON OIL CO., Coldwater, Miss.	
12548	H. G. Cottonseed Meal.....	Coldwater Cotton Oil Co., Coldwater
	CRENSHAW OIL CO., Crenshaw, Miss.	
12549	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw.....
	CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. CO., Crystal Springs, Miss.	
12550	H. G. Cottonseed Meal.....	Crystal Springs Oil Mill, Fert. & M'f'g. Co., Crystal Springs.....
12551	H. G. Cottonseed Meal.....	Crystal Springs Oil Mill, Fert. & M'f'g. Co., Crystal Springs.....
	DELTA OIL CO., Greenville, Miss.	
12552	S. G. Cottonseed Meal	Delta Oil Co., Greenville.....
	DE SOTO OIL COMPANY, Greenville, Miss.	
12553	H. G. Cottonseed Meal.....	DeSoto Oil Co., Greenville.....
12554	H. G. Cottonseed Meal.....	Hannah Distributing Co., Jackson....
	EAGLE COTTON OIL CO., Meridian, Miss.	
12555	H. G. Cottonseed Meal	Eagle Cotton Oil Co., Meridian.....
	EASTMAN OIL MILLS, Jonestown, Miss.	
12556	H. G. Cottonseed Meal.....	Eastman Oil Mills, Jonestown
	EXPORTERS COTTON OIL CO., Gulfport, Miss.	
12557	H. G. Cottonseed Meal.....	Exporters Cotton Oil Co., Gulfport....
	A. H. GEORGE & CO., Meridian, Miss.	
12558	H. G. Cottonseed Meal.....	A. H. George & Co., Meridian.....
	GLEN ALLAN OIL MILL, Glen Allan, Miss.	
12559	H. G. Cottonseed Meal.....	Glen Allan Oil Mill, Glen Allan.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12548	7.16	6.64	6.18	8.07	7.51	29.88	27.81
12549	6.82	7.36	4.59	8.95	6.02	33.12	22.28
12550	5.65	6.94	6.25	8.44	7.60	31.23	28.13
12551	6.42	6.75	6.25	8.21	7.60	30.38	28.13
12552	6.72	5.26	4.95	6.40	6.02	23.67	22.28
12553	6.28	6.16	6.18	7.49	7.51	27.72	27.81
12554	6.95	5.94	6.18	7.22	7.51	26.73	27.81
12555	6.03	6.54	6.18	7.95	7.51	29.43	27.81
12556	7.68	6.33	6.18	7.70	7.51	28.49	27.81
12557	6.60	6.30	6.20	7.66	7.54	28.35	27.90
12558	7.22	6.39	6.18	7.77	7.51	28.76	27.81
12559	6.79	6.33	6.18	7.70	7.51	28.49	27.81

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
12560	GRENADA OIL MILL, Grenada, Miss. H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
12561	HAZLEHURST OIL MILL & FERTILIZER COMPANY, Hazlehurst, Miss. H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst
12562	H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst
12563	HILL CITY OIL WORKS, Vicksburg, Miss. H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
12844	H. G. Cottonseed Meal.....	W. H. Gallaspy's Sons Co., Hickory.....
12564	S. G. Cottonseed Meal.....	Hill City Oil Works, Vicksburg.....
12565	HOLLANDALE COTTON OIL CO., Hollandale, Miss. H. G. Cottonseed Meal.....	Meyer Bros., Meridian.....
12566	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
12567	H. G. Cottonseed Meal.....	Threefoot Bros. & Co., Meridian.....
12568	HOLLYWOOD OIL MILL, Hollywood, Miss. H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
12508	HOUSTON COTTON OIL CO., Houston, Miss. S. G. Cottonseed Meal.....	Houston Cotton Oil Co., Houston.....
12569	S. G. Cottonseed Meal.....	Houston Cotton Oil Co., Houston.....
12443	IMPERIAL COTTON OIL CO., Macon, Miss. H. G. Cottonseed Meal.....	H. B. Hungerford, Wahalak.....
12570	INDIANOLA COTTON OIL CO., Indianola, Miss. H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola....
12571	ITTA BENA COTTON OIL CO., Itta Bena, Miss. H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena....
12572	JACKSON OIL & REFINING CO., Jackson, Miss. H. G. Cotton Seed Meal.....	W. L. Dees, Crystal Springs.....
12573	H. G. Cotton Seed Meal.....	Jackson Oil & Refining Co., Jackson
12574	H. G. Cotton Seed Meal.....	Merchants Grocery Co., Hattiesburg....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12560	7.69	6.36	6.18	7.73	7.51	28.62	27.81
12561	6.03	6.79	6.20	8.26	7.54	30.56	27.90
12562	6.34	7.20	6.20	8.75	7.54	32.40	27.90
12563	7.03	6.26	6.18	7.61	7.51	28.17	27.81
12844	3.16	5.74	6.18	6.98	7.51	25.83	27.81
12564	7.54	6.18	4.95	7.51	6.02	27.81	22.28
12565	6.55	6.30	6.18	7.66	7.51	28.35	27.81
12566	5.60	6.14	6.18	7.47	7.51	27.63	27.81
12567	6.38	5.94	6.18	7.22	7.51	26.73	27.81
12568	7.02	6.33	6.18	7.70	7.51	28.49	27.81
12508	6.13	7.23	4.95	8.79	6.02	32.54	22.28
12569	5.15	7.31	4.95	8.89	6.02	32.90	22.28
12443	4.28	5.79	6.18	7.04	7.51	26.06	27.81
12570	5.02	6.84	6.18	8.32	7.51	30.78	27.81
12571	5.51	6.62	6.18	8.05	7.51	29.84	27.81
12572	4.50	7.21	6.18	8.77	7.51	32.45	27.81
12573	5.27	6.87	6.18	8.35	7.51	30.92	27.81
12574	4.18	7.01	6.18	8.52	7.51	31.55	27.81

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	LAUREL OIL & FERT. CO., Laurel, Miss.	
12575	H. G. Cottonseed Meal 6.56%	Laurel Oil & Fert. Co., Laurel.....
12576	H. G. Cottonseed Meal 6.18%	Laurel Oil & Fert. Co., Laurel.....
12577	H. G. Cottonseed Meal 6.18%	Foote-Patrick Co., Laurel.....
	LELAND OIL WORKS, Leland, Miss.	
12578	S. G. Cottonseed Meal	Leland Oil Works, Leland.....
	LEXINGTON COTTON OIL CO., Lexington, Miss.	
12579	S. G. Cottonseed Meal	Lexington Cotton Oil Co., Lexington
	MAGNOLIA OIL MILL & M'F'G. COMPANY, Magnolia, Miss.	
12580	H. G. Cottonseed Meal.....	Magnolia Oil Mill & M'f'g.Co., Magnolia
	MERIDIAN FERT. FACTORY, Meridian, Miss.	
12581	H. G. Cottonseed Meal	Meridian Fert. Factory, Hattiesburg
12582	"Golden Rod"	Meridian Fert. Factory, Hattiesburg
12583	H. G. Cottonseed Meal	Meridian Fert. Factory, Meridian.....
12584	H. G. Cottonseed Meal	Meridian Fert. Factory, Hattiesburg
	MISSISSIPPI COTTON OIL CO., Jackson, Miss.	
12585	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., West Point.....
12586	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Grenada.....
12587	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Natchez.....
12588	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Yazoo City.....
12589	H. G. Cottonseed Meal.....	Hood Milling Co., Gulfport.....
12590	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Greenville.....
12591	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Jackson.....
12592	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Natchez.....
12593	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
12594	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Meridian.....
12595	H. G. Cottonseed Meal.....	Miss. Cotton Oil Co., Jackson.....
12596	H. G. Cottonseed Meal.....	R. L. Simmons, Newton.....
12597	S. G. Cottonseed Meal	Miss. Cotton Oil Co., Natchez.....
12598	S. G. Cottonseed Meal	Miss. Cotton Oil Co., Jackson.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12575	6.66	6.72	6.56	8.17	7.98	30.24	29.52
12576	6.64	6.35	6.18	7.72	7.51	28.58	27.81
12577	6.95	6.49	6.18	7.89	7.51	29.21	27.81
12578	7.04	6.36	4.95	7.73	6.02	28.62	22.28
12579	5.94	6.80	4.95	8.27	6.02	30.60	22.28
12580	7.06	6.54	6.18	7.95	7.51	29.43	27.81
12581	7.04	6.96	6.59	8.46	8.01	31.32	29.66
12582	7.27	7.01	6.59	8.52	8.01	31.55	29.66
12583	7.05	7.04	6.59	8.56	8.01	31.68	29.66
12584	7.01	6.88	6.18	8.36	7.51	30.96	27.81
12585	7.92	6.29	6.18	7.65	7.51	28.31	27.81
12586	7.36	6.49	6.18	7.89	7.51	29.21	27.81
12587	7.59	6.13	6.18	7.45	7.51	27.59	27.81
12588	5.50	6.39	6.18	7.77	7.51	28.76	27.81
12589	6.49	6.01	6.18	7.31	7.51	27.05	27.81
12590	7.09	6.20	6.18	7.54	7.51	27.90	27.81
12591	8.76	5.85	6.18	7.11	7.51	26.33	27.81
12592	9.42	5.94	6.18	7.22	7.51	26.73	27.81
12593	8.35	6.09	6.18	7.40	7.51	27.41	27.81
12594	9.35	5.31	6.18	6.46	7.51	23.90	27.81
12595	9.38	6.50	6.18	7.90	7.51	29.25	27.81
12596	7.42	5.55	6.18	6.75	7.51	24.98	27.81
12597	8.09	5.63	4.95	6.84	6.02	25.34	22.28
12598	7.63	5.75	4.95	6.99	6.02	25.88	22.28

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	NATCHEZ OIL COMPANY. Natchez, Miss.	
12599	H. G. Cottonseed Meal.....	Natchez Oil Co., Natchez.....
12600	H. G. Cottonseed Meal.....	Natchez Oil Co., Natchez.....
	NEWTON OIL & M'FG. CO., Newton, Miss.	
12601	H. G. Cottonseed Meal.....	Newton Oil & M'fg. Co., Newton.....
	NORTH MISSISSIPPI OIL MILL. Holly Springs, Miss.	
12602	H. G. Cottonseed Meal.....	North Miss. Oil Mill, Holly Springs..
	OKOLONA COTTON OIL CO., Okolona, Miss.	
12599	H. G. Cottonseed Meal.....	Okolona Cotton Oil Co., Okolona.....
12603	H. G. Cottonseed Meal.....	Okolona Cotton Oil Co., Okolona.....
	OXFORD OIL MILL COMPANY. Oxford, Miss.	
12604	H. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
12605	S. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
	PEOPLES COTTON OIL & FIBER COMPANY. North Carrollton, Miss.	
12606	S. G. Cottonseed Meal.....	Peoples Cotton Oil & Fiber Co., North Carrollton.....
	PEOPLES OIL MILL & FERT. WORKS. Aberdeen, Miss.	
12607	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Wks., Aberdeen
	PICKENS COTTON OIL CO., Pickens, Miss.	
12608	S. G. Cottonseed Meal.....	Pickens Cotton Oil Co., Pickens.....
	PHOENIX COTTON OIL COMPANY Como, Miss.	
12609	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
	PLANTERS OIL MILL, Tunica, Miss.	
12610	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12599	5.85	6.41	6.18	7.79	7.51	28.85	27.81
12600	6.15	6.25	6.18	7.60	7.51	28.13	27.81
12601	7.18	6.35	6.18	7.72	7.51	28.58	27.81
12602	5.52	6.87	6.18	8.35	7.51	30.92	27.81
12509	8.41	5.94	6.18	7.22	7.51	26.73	27.81
12603	6.89	6.33	6.18	7.70	7.51	28.49	27.81
12604	6.68	7.05	6.18	8.57	7.51	31.73	27.81
12605	4.39	5.87	4.95	7.14	6.02	26.42	22.28
12606	6.83	5.82	5.40	7.08	6.57	26.19	24.30
12607	6.40	6.53	6.18	7.94	7.51	29.39	27.81
12608	6.37	5.58	4.95	6.78	6.02	25.11	22.28
12609	6.01	7.04	6.18	8.56	7.51	31.68	27.81
12610	5.51	6.37	6.50	7.74	7.90	28.67	29.25

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	PLANTERS OIL MILL & GIN CO., Kosciusko, Miss.	
12611	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
	PLANTERS OIL MILL & M'F'G. COMPANY, Greenwood, Miss.	
12612	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., G'wood
	PONTOTOC COTTON OIL CO., Pontotoc, Miss.	
12613	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc...
	PORT GIBSON OIL WORKS, Port Gibson, Miss.	
12614	S. G. Cottonseed Meal.....	Port Gibson Oil Works, Port Gibson....
12615	S. G. Cottonseed Meal.....	Port Gibson Oil Works, Port Gibson....
	PRODUCERS COTTON OIL CO., Yazoo City, Miss.	
12616	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
12617	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
	ROLLING FORK OIL COMPANY, Rolling Fork, Miss.	
12618	S. G. Cottonseed Meal.....	Rolling Fork Oil Co., Rolling Fork...
	REFUGE COTTON OIL CO., Vicksburg, Miss.	
12619	S. G. Cottonseed Meal.....	Refuge Cotton Oil Co., Greenville.....
12620	S. G. Cottonseed Meal.....	Refuge Cotton Oil Co., Rosedale.....
12621	S. G. Cottonseed Meal.....	Hanes & Hood, Vicksburg.....
	SARDIS OIL COMPANY, Sardis, Miss.	
12622	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
	SENATOBIA OIL COMPANY, Senatobia, Miss.	
12623	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
	SHAW COTTON OIL COMPANY, Shaw, Miss.	
12624	S. G. Cottonseed Meal.....	Shaw Cotton Oil Co., Shaw.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12611	6.46	5.72	6.18	6.95	7.51	25.74	27.81
12612	5.29	6.59	6.18	8.01	7.51	29.66	27.81
12613	6.77	7.19	6.18	8.74	7.51	32.36	27.81
12614	7.42	5.62	5.00	6.83	6.08	25.29	22.50
12615	7.15	5.89	5.00	7.16	6.08	26.51	22.50
12616	7.58	6.18	6.18	7.51	7.51	27.81	27.81
12617	4.20	5.99	6.18	7.28	7.51	26.96	27.81
12618	4.22	6.33	5.00	7.57	6.08	28.39	22.50
12619	5.58	6.21	4.95	7.55	6.02	27.95	22.28
12620	3.99	6.15	4.95	7.48	6.02	27.68	22.28
12621	5.04	6.23	4.95	7.57	6.02	28.04	22.28
12622	2.32	7.57	6.20	9.20	7.54	34.07	27.90
12623	4.21	7.33	6.18	8.91	7.51	32.99	27.81
12624	6.10	6.53	4.95	7.94	6.02	29.39	22.28

TABLE I.—Analyses of Cottonseed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	SHELBY OIL COMPANY, Shelby, Miss.	
12625	H. G. Cottonseed Meal.....	Shelby Oil Co., Shelby.....
	SHUBUTA OIL & M'F'G. CO., Shubuta, Miss.	
12626	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
	SOUTHERN OIL & FERT. CO., Meridian, Miss.	
12627	H. G. Cottonseed Meal.....	Southern Oil & Fert. Co., Meridian....
12868	H. G. Cottonseed Meal.....	M. L. Edwards, Marion.....
	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	
12628	H. G. Cottonseed Meal.....	Tupelo Oil & Ice Co., Tupelo.....
	UNION BROKERAGE & COM- MISSION COMPANY, Vicksburg, Miss.	
12845	Cottonseed Meal.....	O. Hopkins, Hickory.....
	J. LINDSAY WELLS COMPANY, Memphis, Tenn.	
12629	H. G. "Star Brand" Cotton- seed Meal.....	W. A. McDonald, Bay St. Louis.....
12630	H. G. "Star Brand" Cotton- seed Meal.....	Biloxi Milling Co., Biloxi.....
12631	H. G. "Star Brand" Cotton- seed Meal.....	Gulfport Grocery Co., Gulfport.....
	WESSON COTTON OIL & FER- TILIZER COMPANY, Wesson, Miss.	
12632	H. G. Cottonseed Meal.....	Wesson Cotton Oil & Fert. Co., Wesson
12633	H. G. Cottonseed Meal.....	W. F. Funchess & Co., Osyka.....
	WINONA OIL & M'F'G. CO., Winona, Miss.	
12634	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
	WOODVILLE OIL & M'F'G. CO., Woodville, Miss.	
12635	H. G. Cottonseed Meal.....	Woodville Oil & Mfg. Co., Woodville....
12636	S. G. Cottonseed Meal.....	Woodville Oil & Mfg. Co., Woodville....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12625	4.11	6.19	6.18	7.53	7.51	27.86	27.81
12626	6.51	7.12	6.18	8.66	7.51	32.04	27.81
12627	6.82	6.25	6.18	7.60	7.51	28.13	27.81
12868	6.42	6.15	6.18	7.48	7.51	27.68	27.81
12628	7.21	6.51	6.60	7.91	8.02	29.30	29.70
12845	6.76	6.40		7.78		28.80	
12629	4.99	6.07	6.18	7.38	7.51	27.32	27.81
12630	6.65	6.46	6.18	7.85	7.51	29.07	27.81
12631	5.29	6.58	6.18	8.00	7.51	29.61	27.81
12632	5.88	7.07	6.18	8.60	7.51	31.82	27.81
12633	5.50	6.60	6.18	8.02	7.51	29.70	27.81
12634	5.59	7.16	6.18	8.71	7.51	32.22	27.81
12635	5.74	5.75	6.18	6.99	7.51	25.88	27.81
12636	6.58	6.02	4.95	7.32	6.02	27.09	22.28

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1909-1910.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen (Guaranteed) Per Ton.
12365	ABERDEEN OIL & ICE COMPANY, Aberdeen, Miss. H. G. Cottonseed Meal	12365	5.69	6.85	6.18	8.33	7.51	30.83	27.81
12144	ALABAMA COTTON OIL COMPANY, Mobile, Ala. H. G. Cottonseed Meal	12144	7.50	6.23	6.18	7.57	7.51	28.04	27.81
12125	ALCORN COTTON OIL COMPANY, Corinth, Miss. H. G. Cottonseed Meal	12125	6.75	6.81	6.18	8.28	7.51	30.64	27.81
12514	ANGUILLA OIL & GIN COMPANY, Anguilla, Miss. H. G. Cottonseed Meal	12514	5.59	6.44	6.18	7.83	7.51	28.98	27.81
12874	ARCOLA OIL MILL, Arcola, Miss. H. G. Cottonseed Meal	12874	8.26	6.80	6.18	8.27	7.51	30.60	27.81
12040	BARBER & LEWIS OIL COMPANY, Edwards, Miss. H. G. Cottonseed Meal	12040	8.71	6.29	6.18	7.65	7.51	28.31	27.81
	F. W. BRODE & COMPANY, Memphis, Tenn.								

12362 12363	H. G. Cottonseed Meal S. G. Cottonseed Meal	12362 12363	6.31 7.35	6.19 5.32	6.20 4.95	7.53 6.47	7.54 6.02	27.86 23.94	27.90 22.28
12374	H. G. Cottonseed Meal	12374	5.36	5.99	6.18	7.28	7.51	26.96	27.81
12123	H. G. Cottonseed Meal	12123	7.65	6.12	6.18	7.44	7.51	27.54	27.81
12150 12151	H. G. Cottonseed Meal S. G. Cottonseed Meal	12150 12151	7.55 6.23	6.38 5.63	6.18 4.95	7.76 6.84	7.51 6.02	28.71 25.34	27.81 22.28
12135	H. G. Cottonseed Meal	12135	6.98	6.61	6.18	8.04	7.51	29.75	27.81
12162	H. G. Cottonseed Meal	12162	5.85	6.93	5.00	8.43	6.08	31.19	22.50
12121 12946	H. G. Cottonseed Meal S. G. Cottonseed Meal	12121 12946	3.59 6.97	6.58 5.56	6.18 4.95	8.00 6.76	7.51 6.02	29.61 25.02	27.81 22.28
12513	H. G. Cottonseed Meal	12513	5.32	7.13	4.95	8.67	6.02	32.09	22.28
12141	H. G. Cottonseed Meal	12141	6.11	6.97	6.25	8.47	7.69	31.37	28.13

BROOKHAVEN COTTON OIL & FERTILIZER COMPANY,

Brookhaven, Miss.

BUCKEYE COTTON OIL COMPANY,

Jackson, Miss.

BUTLER-KYSER OIL & FERTILIZER COMPANY,

Fayette, Miss.

CANTON OIL MILL COMPANY,

Canton, Miss.

CENTRAL COTTON OIL COMPANY,

Jackson, Miss.

CENTREVILLE COTTON OIL COMPANY,

Centreville, Miss.

CLAY COUNTY COTTON OIL COMPANY,

West Point, Miss.

CRENSHAW OIL COMPANY,

Crenshaw, Miss.

CRYSTAL SPRINGS OIL MILL, FERTILIZER & M'FG. COMPANY,

Crystal Springs, Miss.

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1909-1910.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12142	DELTA OIL COMPANY, Greenville, Miss. S. G. Cottonseed Meal	12142	5.68	5.80	4.95	7.05	6.02	26.10	22.28
12373	DE SOTO OIL COMPANY, Greenville, Miss. H. G. Cottonseed Meal	12373	6.41	6.10	6.18	7.42	7.51	27.45	27.81
12313	DUMAS GROCERY COMPANY, Mobile, Ala. H. G. Cottonseed Meal	12313	6.71	6.27	6.18	7.62	7.51	28.22	27.81
12366	EAGLE COTTON OIL COMPANY, Meridian, Miss. H. G. Cottonseed Meal	12366	6.19	6.74	6.18	8.19	7.51	30.33	27.81
12944	EASTMAN OIL MILLS, Jonestown, Miss. H. G. Cottonseed Meal	12944	8.86	6.94	6.18	8.44	7.51	31.23	27.81
12875	EXPORTERS COTTON OIL COMPANY, Gulfport, Miss. H. G. Cottonseed Meal	12875	7.87	7.35	6.20	8.94	7.54	33.08	27.90

12131	A. H. GEORGE & COMPANY, Meridian, Miss. H. G. Cottonseed Meal	12131	7.15	6.54	6.18	7.95	7.51	29.43	27.81
12154	J. T. GIBBONS, New Orleans, La. H. G. Cottonseed Meal	12154	7.35	6.46	6.18	7.85	7.51	29.07	27.81
12136	B. F. GLOVER & SON COMMISSION COMPANY, New Orleans, La. H. G. Cottonseed Meal	12136	6.68	6.45	6.18	7.84	7.51	29.03	27.81
12137	O. G. Cottonseed Meal	12137	7.41	3.51	3.50	4.27	4.26	15.80	15.75
12139	GRENADA OIL MILL, Grenada, Miss. H. G. Cottonseed Meal	12139	5.18	6.29	6.18	7.65	7.51	28.31	27.81
12218	HAZLEHURST OIL MILL & FERTILIZER COMPANY, Hazlehurst, Miss. H. G. Cottonseed Meal	12218	5.76	6.42	6.20	7.81	7.54	28.89	27.90
12140	FRED HEAKES & SON, Mobile, Ala. H. G. Cottonseed Meal	12140	7.19	5.37	6.18	6.53	7.51	24.17	27.81
12319	HOLLANDALE COTTON OIL COMPANY, Hollandale, Miss. H. G. Cottonseed Meal	12319	6.40	6.11	6.18	7.43	7.51	27.50	27.81
12143	IMPERIAL COTTON OIL COMPANY, Macon, Miss. H. G. Cottonseed Meal	12143	7.44	6.15	6.18	7.48	7.51	27.68	27.81
12096	INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss. H. G. Cottonseed Meal	12096	4.54	7.00	6.18	8.51	7.51	31.50	27.81

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1909-1910.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen Found.	Ammonia—Equivalent of Nitrogen Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12133	INDIANOLA COTTON OIL COMPANY, Indianola, Miss. H. G. Cottonseed Meal.....	12133	6.03	6.55	6.18	7.96	7.51	29.48	27.81
12310	JACKSON FERTILIZER COMPANY, Jackson, Miss. H. G. Cottonseed Meal.....	12310	7.15	6.79	6.18	8.26	7.51	30.56	27.81
12943	JACKSON OIL & REFINING COMPANY, Jackson, Miss. H. G. Cottonseed Meal.....	12943	8.65	7.00	6.18	8.51	7.51	31.50	27.81
12122	LAUREL OIL & FERTILIZER COMPANY, Laurel, Miss. H. G. Cottonseed Meal 6.56%.....	12122	6.54	6.59	6.56	8.01	7.98	29.66	29.52
12370	H. G. Cottonseed Meal 6.18%.....	12370	5.76	6.14	6.18	7.47	7.51	27.63	27.81
12361	LELAND OIL WORKS, Leland, Miss. S. G. Cottonseed Meal.....	12361	7.35	5.64	4.95	6.86	6.02	25.38	22.28
12138	LEXINGTON COTTON OIL COMPANY, Lexington, Miss. S. G. Cottonseed Meal.....	12138	6.46	6.52	4.95	7.93	6.02	29.34	22.28

12369	H. G. Cottonseed Meal	MAGNOLIA OIL MILL & M'F'G. COMPANY, Magnolia, Miss.	12369	7.24	6.61	6.18	8.04	7.51	29.75	27.81
12160	H. G. Cottonseed Meal	McINNIS & STURGIS, Meridian, Miss.	12160	5.76	6.87	6.18	8.35	7.51	30.92	27.81
12873	H. G. Cottonseed Meal	McMILLAN & HARRISON, Mobile, Ala.	12873	8.00	7.12	6.18	8.66	7.51	32.04	27.81
12642	H. G. Golden Rod Cottonseed Meal 6.59%	MERIDIAN FERTILIZER FACTORY, Meridian, Miss.	12642	8.48	6.91	6.59	8.40	8.01	31.10	29.66
12643	H. G. Cottonseed Meal 6.18%		12643	8.47	6.56	6.18	7.98	7.51	29.52	27.81
12159	H. G. Cottonseed Meal	MISSISSIPPI COTTON OIL COMPANY, Jackson, Miss.	12159	6.55	6.82	6.18	8.29	7.51	30.69	27.81
12129	S. G. Cottonseed Meal		12129	6.97	5.69	4.95	6.92	6.02	25.61	22.28
12153	H. G. Cottonseed Meal	NATCHEZ OIL COMPANY, Natchez, Miss.	12153	6.47	6.45	6.18	7.84	7.51	29.03	27.81
12130	H. G. Cottonseed Meal	NORTH MISSISSIPPI OIL MILLS, Holly Springs, Miss.	12130	3.46	7.26	6.18	8.83	7.51	32.67	27.81
12126	H. G. Cottonseed Meal	OKOLONA OIL COMPANY, Okolona, Miss.	12126	6.22	6.99	6.18	8.50	7.51	31.46	27.81
12368	H. G. Cottonseed Meal	OXFORD OIL MILL COMPANY, Oxford, Miss.	12368	6.14	6.55	6.18	7.96	7.51	29.48	27.81

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1909-1910.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen Found.	Ammonia—Equivalent of Nitrogen Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12064	PEOPLES COTTON OIL & FIBER COMPANY, North Carrollton, Miss.	12064	8.26	5.76	5.40	7.00	6.57	25.92	24.90
12145	PEOPLES OIL MILL & FERTILIZER WORKS, Aberdeen, Miss.	12145	6.95	6.40	6.18	7.78	7.51	28.80	27.81
12132	PHOENIX COTTON OIL COMPANY, Como, Miss.	12132	7.08	7.25	6.18	8.81	7.51	32.63	27.81
12371	PICKENS COTTON OIL COMPANY, Pickens, Miss.	12371	3.24	5.92	4.95	7.20	6.02	26.64	22.28
12876	PLANTERS GIN & OIL COMPANY, Baldwyn, Miss.	12876	7.72	7.34	6.18	8.92	7.51	33.03	27.81
12147	PLANTERS OIL MILL & GIN COMPANY, Kosciusko, Miss.	12147	6.88	6.69	6.18	8.13	7.51	30.11	27.81

12877	H. G. Cottonseed Meal PLANTERS OIL MILL & M'FG. COMPANY, Greenwood, Miss.	12877	8.19	6.71	6.18	8.16	7.51	30.20	27.81
12149	H. G. Cottonseed Meal PLANTERS OIL MILL, Tunica, Miss.	12149	5.91	6.47	6.50	7.87	7.90	29.12	29.25
12128	S. G. Cottonseed Meal PLANTERS OIL WORKS, Clarksdale, Miss.	12128	7.05	6.44	5.00	7.83	6.08	28.98	22.50
12357	H. G. Cottonseed Meal PONTOTOC COTTON OIL COMPANY, Pontotoc, Miss.	12357	5.26	7.14	6.18	8.68	7.51	32.13	27.81
12356	S. G. Cottonseed Meal PORT GIBSON OIL WORKS, Port Gibson, Miss.	12356	5.82	5.13	5.00	6.24	6.08	23.09	22.50
12872	H. G. Cottonseed Meal PRODUCERS COTTON OIL COMPANY, Yazoo City, Miss.	12872	8.25	6.64	6.18	8.07	7.51	29.88	27.81
12152	H. G. Cottonseed Meal REFUGE COTTON OIL COMPANY, Columbus, Miss.	12152	7.08	6.39	6.18	7.77	7.51	28.76	27.81
12134	S. G. Cottonseed Meal REFUGE COTTON OIL COMPANY, Greenville, Miss.	12134	5.24	6.00	4.95	7.29	6.02	27.00	22.28
12367	S. G. Cottonseed Meal ROLLING FORK OIL COMPANY, Rolling Fork, Miss.	12367	5.95	5.94	5.00	7.22	6.08	26.73	22.50
12156	H. G. Cottonseed Meal SARDIS OIL COMPANY, Sardis, Miss.	12156	5.15	7.38	6.20	8.97	7.54	33.21	27.90

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1909-1910.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent.	Nitrogen Guaranteed.	Ammonia—Equivalent of Nitrogen—Found.	Ammonia—Equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Per Ton.	Value of Nitrogen Guaranteed Per Ton.
12372	H. G. Cottonseed Meal SENATOBIA OIL COMPANY, Senatobia, Miss.	12372	7.08	7.24	6.18	8.80	7.51	32.58	27.81
12157	H. G. Cottonseed Meal SHELBY OIL COMPANY, Shelby, Miss.	12157	5.67	7.27	6.18	8.84	7.51	32.72	27.81
12644	S. G. Cottonseed Meal SHUBUTA OIL & M'F'G. COMPANY, Shubuta, Miss.	12644	6.33	5.96	4.95	7.25	6.02	26.82	22.28
12641	H. G. Cottonseed Meal SOUTHERN COTTON OIL COMPANY, Memphis, Tenn.	12641	6.92	7.38	6.18	8.97	7.51	33.21	27.81
12124	H. G. Cottonseed Meal SOUTHERN OIL & FERTILIZER CO. Meridian, Miss.	12878	8.01	7.20	6.18	8.75	7.51	32.40	27.81
12201	H. G. Cottonseed Meal STANDARD GUANO & CHEMICAL M'F'G. COMPANY, New Orleans, La.	12201	6.54	6.50	6.47	7.90	7.87	29.25	29.12

12046	H. G. Cottonseed Meal	Starkville, Miss.	12046	8.69	6.22	6.18	7.56	7.51	27.99	27.81
12109	H. G. Cottonseed Meal	Sulligent, Ala.	12109	6.58	6.88	6.18	8.36	7.51	30.96	27.81
12127	H. G. Cottonseed Meal	TATE BROTHERS, Hollywood, Miss.	12127	6.58	6.18	6.18	7.51	7.51	27.81	27.81
12155	H. G. Cottonseed Meal	TENNESSEE COTTON OIL COMPANY, Memphis, Tenn.	12155	7.02	6.38	6.18	7.76	7.51	28.71	27.81
12146	H. G. Cottonseed Meal	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	12146	7.46	7.20	6.60	8.75	8.02	32.40	29.70
12364	S. G. Cottonseed Meal	VICKSBURG COTTON OIL COMPANY, Vicksburg, Miss.	12364	6.78	6.09	5.00	7.40	6.08	27.41	22.50
12358	H. G. Cottonseed Meal	J. LINDSAY WELLS COMPANY, Memphis, Tenn.	12358	5.18	6.53	6.18	7.94	7.51	29.39	27.81
12359	S. G. Cottonseed Meal	WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss.	12359	8.73	3.48	4.95	4.23	6.02	15.66	22.28
12158	H. G. Cottonseed Meal	WINONA OIL & M'FG. COMPANY, Winona, Miss.	12158	6.65	6.84	6.18	8.32	7.51	30.78	27.81
12360	H. G. Cottonseed Meal		12360	5.99	6.56	6.18	7.98	7.51	29.52	27.81

Mississippi Agricultural Experiment Station.

BULLETIN No. 129.

SUGAR CANE FOR SYRUP MAKING.

By E. B. FERRIS.

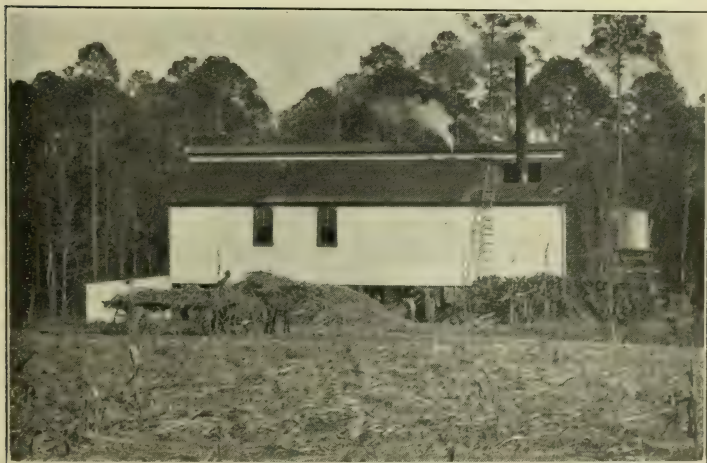


FIG. 1.—SYRUP HOUSE.

AGRICULTURAL COLLEGE, MISSISSIPPI.

DECEMBER, 1909.

MCNEILL EXPERIMENT STATION, Nov. 15, 1909.

SIR:—

I submit herewith manuscript for bulletin on Sugar Cane for Syrup Making, being somewhat a popular treatise based on practical experience and the results of eight years' work with cane at this station.

Respectfully,

E. B. FERRIS,

Assistant Director.

W. L. HUTCHINSON, Director,

Mississippi Experiment Station.

SUGAR CANE FOR SYRUP MAKING.

E. B. FERRIS.

Introduction.—With the appearance of the cotton boll weevil in Mississippi the farmers will be on the alert for other crops to substitute for cotton and sugar cane grown for syrup will be one of these crops. It is admirably suited to the soils and climate of South Mississippi and may be grown for home consumption over almost the entire state. In South Mississippi it could be made a money crop, for the sandy-loam soils here produce a syrup of unsurpassed color and flavor, far superior to that from cane grown on the stiffer lands of this state and Louisiana. At present, however, the syrup made here by numerous individual growers of cane is so lacking in uniformity and so apt to prove disappointing to the trade that it is really difficult to dispose of our present acreage. However, we know from experience that there is a demand for this syrup in great quantity if the growers of cane can only be taught the importance of thoroughly cleaning the juices, of cooking to a standard density, and of immediately sealing the syrup in a package that the trade demands.

Soils suited to sugar cane.—Sugar cane is a gross feeder and requires a great quantity of water during its growing period. A yield of 45 tons of cane to the acre would require, according to Dr. Stubbs over 56 inches of rainfall. Cane, therefore, should be planted only on the lands full of organic matter or humus for holding water and well supplied either naturally or artificially with plant food elements. It occupies the land at least two and sometimes three years from a single planting, in practice there is no way to restore the humus during this time, and withal is such a nitrogen consumer that it would be well never to plant the crop except on land that has just grown a crop of cowpeas or velvet beans.

History.—Sugar cane belongs to the large family of grasses and is said to have been first grown in China and India. It was introduced into this country by the planters around New Orleans and is extensively grown in Louisiana for making both syrup and sugar. It does not form seed in this climate but in countries farther south

some varieties throw out seed stems when from twelve to thirteen months old and reach maturity some three months later. However, the seeds from sugar cane germinate very poorly and it has been only in recent years that they have been used at all as a means of propagation and even now they are only used for introducing new varieties. In this and in all tropical countries, even, cane is propagated commercially by planting the stalks. A sugar cane stalk is made up of a series of nodes and internodes and at each node or joint is a bud which sprouts and forms a stalk. These stalks sucker or tiller freely so that from every original one from three to ten stalks should be found at the harvest and in tropical countries many more than this.

Saving seed cane.—Seed cane should be allowed to grow as late as possible in the fall consistent with danger from frost. In the latitude of McNeill we seldom have a frost that will injure the buds before the tenth of November and frequently not until much later than this. As a rule the oldest stubble cane should for several reasons be used for seed; cutting cane very long before frost causes it to sprout and these sprouts always get killed injuring the stand for the succeeding year; the greater part of the seed cane is saved by windrowing in field between old rows of cane and in covering this the stubbles are badly injured; the stubble cane being grown after the land has become somewhat impoverished is nearly always shorter jointed and gives more eyes per running foot than the plant cane, besides it is more woody and does not yield as much juice.

In practice the seed cane is either planted in the fall or is protected by windrowing through the winter and planted in early spring. The best results at McNeill have been had with fall planting. It is a laborious job to handle seed cane and a lot of work is saved by fall planting; the canes sprout quicker in the spring and get an advantage in this way; besides our experience has been that fewer eyes are lost through the winter, and none are lost by breaking as is always the case with spring planting. For fall planting the ground should be thoroughly prepared and rows opened $4\frac{1}{2}$ or 5 feet apart with middle burster or with two furrows from a turn plow, the seed canes should be dropped in this furrow and covered with from three to four inches of dirt. If the weather is dry a heavy roller should follow the covering of the cane to bring moisture to it and prevent "dry rot." Where natural drainage is good as is the case on the hill lands of this section dry rot is the greatest destroyer of seed. In poorly drained soils "wet rot" will be equally destructive and under such conditions it

would be best in case of fall planting to first throw up beds nine or ten feet wide and plant two rows of cane to each bed.

Where spring planting is done the seed cane should be cut in the fall and promptly piled shingle fashion between the old rows of cane and immediately covered by running furrows with turn plow on either side, throwing the dirt on the cane and following at once with hoes to complete the covering. It is best to do this while the weather is damp or else to pour water over the windrowed cane. Prompt covering with dirt keeps out the air, prevents the drying out of the cane, and will save much loss from dry rot.

Quantity of seed required to plant an acre.—A question frequently asked on farmers institute work and through correspondence is the quantity of seed required to plant an acre. We will assume that standard rows will be five feet apart. This would give forty-two rows 210 feet long to the acre and would require 8,820 feet of cane. Assuming that each stalk will be four feet long, it would require 2,205, or, if we double them in the drill 4,410 stalks. Each of these stalks will weigh about two pounds giving a total of about four and one-half tons to plant an acre. On land thoroughly prepared and carefully planted in the fall we feel sure that a good stand could be obtained by half lapping the cane in the drills and using about 3,500 stalks to the acre. This is especially true if care is taken in the spring to remove the dirt from the cane rows and allow every opportunity for it to sprout promptly.

Should the stalks be cut?—In planting stalks of cane it is generally supposed that they should be cut into short pieces, the popular impression being that otherwise the stalks that sprout first will draw strength from the eyes unsprouted and prevent them coming up at all. This argument is fallacious according to the results of the Louisiana Experiment Station which results seem to have been borne out here by practical experience. Each eye or bud on the stalk is independent of the other and the cutting of the cane, especially in fall planting, only serves to introduce fermentation and decay. If the seed stalks are straight (which is seldom the case) it is best not to cut them at all, but if they are crooked they should be cut in two or more pieces so as to make them lie flat in the furrow and lessen the danger of pulling them up in cultivation or of covering a part of the stalk too deep and another part too shallow.

What part of the stalk to plant.—In ordinary practice the entire stalk of cane is planted, but a considerable economy might be prac-

ticed by using the lower two-thirds of the stalk for grinding and the upper one-third for planting. The upper part of the stalk has considerably less sugar in it than the lower portion and experience has shown that it is as good if not better for seed than the more mature parts. This station has experimented with saving the tops for seed with good success where as many as five or six mature joints were left with the tops but with poor success where only one or two joints were left as has been recommended by enthusiasts on this subject.

Varieties.—In recent years a number of varieties of cane have been introduced into this country from all over the cane-producing world and the Louisiana Sugar Station has tested possibly hundreds of them at New Orleans. They were kind enough to give us a number of these varieties in small lots but we were only successful in getting two kinds to sprout. We have now growing on the station, purple, ribbon, Japanese, and the two new varieties referred to, D. 74 and D. 95. So far we have not found the ordinary purple cane to be inferior to the rest, and as this is the kind most widely distributed in this state, we would recommend a continuance of its use, introducing new kinds only in an experimental way. In comparative tests here the ribbon and purple canes grown under like conditions have yielded equally well. The Japanese cane is not regarded as being so good as the larger canes for syrup, though on account of its extreme hardness it might be better for more northern latitudes. The stalks of this variety are very small besides being quite hard and woody, making it expensive to prepare for grinding as well as difficult to grind. As compared to an extraction of 72% with the purple cane we got only 60% with Japanese, there was from 15% to 25% less saccharine matter in the juice, and the small stalks were extremely difficult to grind. This Japanese cane seems better suited for forage than for syrup here and we have a number of tests in progress with it in feeding hogs and cattle.

Fertilizers.—Seed cane should have a light application of fertilizer at the time it is planted for the reason that around each joint the mother cane puts forth roots and if these roots are promptly fed the stalks of young cane will grow off much more vigorously. Aside from this, it is best to apply the bulk of the fertilizer to both plant and stubble cane in the spring after the stand is about complete and the dirt ready to be thrown back to the cane rows. This fertilizer should be applied on both sides of the cane rows and also scattered across this row. A number of tests have been conducted here to show the

effects of different plant food materials on the yields of cane, also to show the advantage of one or more applications of a given fertilizer. These tests while not altogether conclusive lead us to advise under average conditions making a single application of the fertilizer in the spring and not a part then and the balance later. This does not have reference to the small quantity that should be put under plant cane to give it a more vigorous start.

Results here so far have shown no material increase in yield due to the presence of potash salts in a fertilizer. On good land these



CORNER OF FERTILIZER TEST PLATS.

results show that from 1000 to 1500 pounds may be used profitably per acre and that under average conditions this should be composed of about equal parts acid phosphate and cottonseed meal or its equivalent of some other carrier of organic nitrogen. Sugar cane should always follow a leguminous crop and be planted on land well supplied with humus. On such land the supply of nitrogen the first year may be considerably reduced, a fertilizer made of two parts acid phosphate and one part cottonseed meal answering admirably. On the stubble cane of the year following the supply of nitrogen should be increased by using equal parts of meal and phosphate and in case a second year's stubble is grown it would be well to use a mixture of two parts cottonseed meal and one part of acid phosphate, buying none but the best

grades of each substance. In saying cottonseed meal we mean always that should the price of this material not justify its use, dried blood, tankage, or fish scrap, furnishing an equal number of pounds of nitrogen, may be substituted for it.

The following table gives the results of two years work here with fertilizers under plant and stubble cane:

Results with Fertilizers under Sugar Cane.

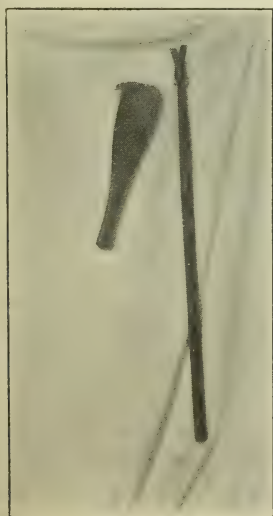
Number of Plat.	Area.	Cottonseed Meal Lbs. per Acre.	Acid Phosphate, Lbs. per Acre.	Kainit, Lbs. per Acre.	Yield per Plat, Lbs.	Yield per Acre, Lbs.	Yield per Acre, Tons.	Yields per Acre in Tons of Stubble Cane.	
1	.062 A.	210	208	90	3660	58,560	29.3	16.9	Purple Cane.
2	.062 A.	210	208	90	3570	57,120	28.6	16.7	Ribbon Cane.
3	.062 A.	210	454	90	4340	69,440	34.7	20.8	
4	.062 A.	420	416	180	4280	68,480	3.42	21.0	One-half applied in spring and one- half in July.
5	.062 A.	420	416	180	4400	70,400	35.2	20.4	
6	.062 A.	210	208		3850	61,600	30.8	17.0	
7	.062 A.	105	104	49	4110	65,760	32.9	16.9	
8	.062 A.	838	832	358	4900	78,400	39.2	22.6	
8	.062 A.	838	832	358	4900	78,400	39.2	22.6	
9	.062 A.				3830	61,280	30.6	16.8	
10	.062 A.	420	162	61	4050	64,800	32.4	18.0	

Cultivation.—After the cane has been planted and is ready to sprout in the spring it is very important to remove all surplus dirt from above it so as to allow the young sprouts to come through. This is done by barring off the rows with turn plows and removing dirt above the cane with hoes. The stubble cane should be treated pretty much the same way and the dirt removed from around the stubbles with hoes or pronged forks, or better by a stubble digger. Experience

here has been that the stubbles will keep through the winter as well and possibly better by simply leaving them with no more dirt above them than would naturally accumulate in cultivation. The Louisiana Experiment station recommends the burning of all fodder and other trash as early in the winter as possible. If any considerable area of stubble cane is to be cultivated it will pay to buy a stubble digger, a two-horse implement made by B. F. Avery & Sons and costing about \$60.00. This implement is almost human in the way it works cane stubbles and it reduces the cost over hoes in the same proportion that the mowing machine does over the scythe.

With proper care in early spring the sprouts from both stubble and plant cane will quickly show above the ground and the dirt should not be thrown back to them until sprouting has been about completed. It is then that the fertilizer is applied and the dirt returned to the row after which cultivation should proceed as with other farm crops such as corn or cotton. Shallow cultivation is to be greatly preferred and for single horse work we have found nothing superior to the "Diverse" cultivator which is generally sold by the implement dealers in this territory. Cultivation should be frequent and shallow to keep down weeds and maintain a dust mulch for conserving moisture.

Harvesting.—In the fall the blades must be stripped from the cane, the tops removed, and the stalk severed at the surface of the ground. The implement used almost universally for this is the ordinary cane knife, a flat piece of steel on a suitable handle with a slight hook on the back for stripping. In the Louisiana cane fields the cane is stripped by two downward strokes with the back of the knife, the third lick removes the top, and the fourth severs the stalk at the ground, the entire operation being completed as the workman proceeds.



Mr. Wm. Howse, a farmer of Cairo, Ga., has invented a simple cane stripper made of two pieces of thin steel about 15 inches long by 1 inch wide and 1-16 inch thick, bent and flared at one end so as to slip over and fit around the stalk of cane and securely bradded at the other end to a handle three feet long. This stripper re-

moves the blades with a single downward stroke and has been found here to be a very useful implement. With this implement the blades are removed by one set of hands while others follow with knives and remove the tops and cut the stalks. Much work has been done on the perfection of a cane harvester but with poor success on account of the extreme difficulty of handling crooked canes by machinery.

Yields of cane.—The yields of cane vary widely of course with fertility of land, cultivation, seasons, etc., but on reasonably good land here a yield of as much as twenty tons of plant cane and fifteen tons of stubble cane per acre may reasonably be expected, a ton of cane corresponding roughly to twenty gallons of syrup. In 1907 this station had about twelve acres planted to cane, a good portion of which was on thin hill land that was very rolling. Of this entire acreage there was 1.1 acres of Japanese cane which yielded 34.7 tons and made 537 gallons of syrup, or 15.5 gallons to the ton. The remaining 10.9 acres of purple cane made 224 tons which gave 4,236 gallons of syrup or 18.9 gallons per ton. In 1908 Japanese cane made only 13.7 gallons of syrup to the ton while the purple cane made twenty-two. In 1907 when we used sulphur, lime and "Clariphos" for cleaning cane juices the syrup from Japanese was of good quality, but in 1908 when the use of these materials was discontinued the syrup had an extremely biting taste and would not sell in competition with syrup made from purple cane at the same time and in the same way. In fact, this syrup would not sell at all and we have practically all of it on hand now.

On the choicest spots in the cane field above mentioned the yields run up to above 800 gallons of syrup to the acre and on one plat of .43 acre we weighed up 49,735 pounds of cane which made 470 gallons of syrup, or at the rate of 1,092 gallons to the acre. This was on level hill land that had been fertilized with raw cotton seed, animal manures, and acid phosphate in 1905, planted to cabbage and again fertilized in 1906, purple cane planted in fall of 1906 and fertilized the following spring with equal parts acid phosphate and cottonseed meal at the rate of 500 lbs. of each to the acre. It is well to say that this cane began sprouting soon after Christmas, these sprouts were never killed, and a perfect stand was obtained in the very early spring, all conditions being favorable to its development through the year.

In this connection we would caution cane growers about the use of fresh animal manures under the crop. They will give an immense yield but have a tendency to give a salty, disagreeable taste to the syrup. If used they should be applied to some crop preceding the cane.

Handling cane.—Sugar cane is an extremely heavy crop and difficult to handle. It seldom remains erect until harvested, being nearly always blown down by winds in summer after which it grows in all sorts of shapes. When cut it is usually piled in heaps in every third row so that wagons may be driven through to pick it up. If loaded into an ordinary wagon body it is difficult to get to and troublesome to unload and in this state it is seldom grown in sufficient quan-

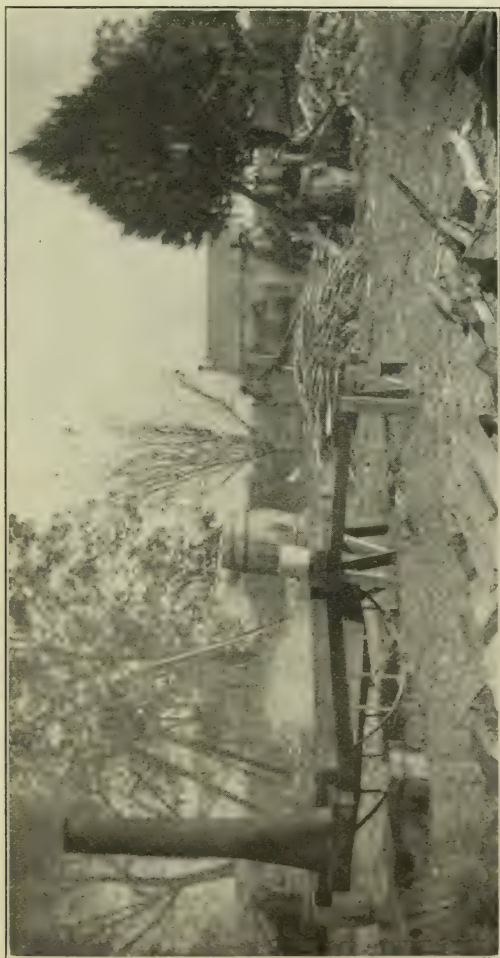


FIG. 4. SYRUP MAKING OUTFIT.

ties to warrant the use of machinery for unloading, though if placed on ropes as it is loaded into the wagon body, simple hoisters may be improvised for lifting it out. In the absence of such a device or of

carts or wagons that will dump the cane, the station has found an ordinary hay frame with side boards one foot high a very good means of hauling so as to facilitate unloading, also it has found an ordinary wood frame made to haul 4-foot wood much better than a wagon body because the standards on such a frame may be removed and the cane quickly unloaded by hand.

Syrup making.—The most of the cane manufactured in this state is ground on 3-roller horse mills that are seldom screwed up as closely as they should be and the percentage of the juice extracted is far below what the cane contains. In examining several mills around the country the extraction was found to average below 60% but the same mills by screwing up as closely as possible would give an extraction of 65% or more. The Experiment Station has a 3-roller mill of 6 h. p. capacity run by steam and gets a 72% extraction. A five roller mill would be much better and ought to give an extraction of 75% or more. So, as at present handled, a large part of the juice of the cane is left in the bagasse and goes to waste.

The common method of making syrup by the average grower of cane is about as follows: the juice runs from the mill through a burlap bag into a barrel; from this it is usually removed in buckets and poured into another barrel elevated above one end of the evaporator; from this it runs through a faucet into the evaporator and the flow is so regulated that constant streams of juice enter while equally constant quantities of syrup come out at the opposite end, in the proportion of about six to one; while the juice is going the circuit of the evaporator it is being skimmed and cleaned and by the time it reaches the sirup stage it is possible to have it fairly pure. An expert manipulator may make a fair quality of syrup in this way, but the average man will not clean the juice well and will either cook it too much when the syrup will go to sugar or too little when it will ferment. On such an apparatus it is impossible even for an expert with a saccharimeter to get all the syrup cooked to the same gravity and this ought to be the first and most important object in view.

A better quality of syrup may be made on just as simple an outfit as the one described by substituting a pan or kettle for the evaporator and by cooking a definite quantity of juice down to syrup, skimming thoroughly, and finally testing the density of the syrup with a saccharimeter that may be bought for a few cents or even improvised at home. One of the most successful syrup makers in this country uses a pan that he made himself out of galvanized iron for the bottom and poplar boards for sides. This pan is three feet wide, fifteen inches

deep, and $7\frac{1}{2}$ feet long with a trough at one end for catching the skimmings. He cooks 150 gallons of juice at the time and gets from 22 to 30 gallons of syrup from it. The cooking is done with wood and towards the end of the operation the fires are allowed to go down so that when the proper density is reached the syrup may be removed before its density can be materially increased. This party makes from fifty to sixty gallons of syrup a day on the one pan which is about the capacity of the ordinary evaporator. On the ordinary evaporator there is about an hour between the time the juice enters and comes out as syrup and on the pan described five hours. In the one the evaporation takes place in shallow depths and in the other a large part of the boiling is done in depths of from five to twelve inches. Naturally less of the crystallizable sugar is converted into non-crystallizable in the first process than in the second so that syrup of the same gravity made on an evaporator is more likely to go to sugar than if cooked in a kettle or pan.

Cooking by steam.—Really the best means of evaporating cane juice is by steam and if any considerable acreage is ever devoted to sugar cane in a given community, it will pay to have a public syrup factory just as we now have public gins. Really the two could and should be run in combination, using the same boiler and engine first to operate the gin and later to grind the cane and evaporate the juice. This has always been a feasible plan, but now since the advent of the boll weevil it would seem especially so, for there will likely be no cotton to gin after the fifteenth of October and we would not care to begin syrup making earlier than this. With a boiler and engine at hand it will be simple and inexpensive to install a cheap but effective system for grinding cane and cooking syrup. The greatest trouble will be in a lack of boiler capacity, since much more steam will be required to cook syrup than is usually found necessary to run a small cotton gin. In a specially designed syrup factory here we have a 40 h. p. boiler with only an 8 h. p. engine and 6 h. p. mill; this will show the relative quantities of steam required for grinding and for cooking. Syrup factories might be run in connection with several other industries, namely, ice plants, grist mills, canning factories, and even saw mills. We know of one ice plant in the state that will put in a syrup making outfit and of one syrup plant that saws lumber a part of the year.

Arrangement of syrup house.—The McNeill Experiment Station has a complete syrup making plant designed and equipped by the Blymyer Iron Works Co., of Cincinnati, Ohio. The machinery in this

plant cost about \$2,200.00 and consists of a 40 h. p. boiler; 8 h. p. engine; 6 h. p. mill with cane and bagasse carriers; two 200-gallon juice tanks; 2 300-gallon defecators; 3 300-gallon settling tanks; 1 400-gallon evaporator; 1 boiler feed pump; 1 juice pump; 1 sulphur apparatus consisting of stove, cooling tank and sulphur box; together with all necessary pipe, steam coils, valves and other fittings for connecting all into a working unit. This machinery is housed in a building 26 feet wide and 72 feet long, with 22 foot side walls and an extreme height of thirty feet. This apparatus is so arranged that the boiler, engine and cane mill set on the ground floor; the juice tank is sunk so that the top of it is on a level with the ground floor. The juice is picked up from this tank by a rotary pump run by the same shaft which turns the cane mill and is pushed to the extreme height of the building where it enters the top of the sulphur box and flows back and forth over a series of super-imposed copper shelves coming intimately in contact with fumes from burning sulphur which enter this box from below and pass out at the top. This sulphur is burned in a small stove also set on the ground floor and the fumes are conducted through a two-inch pipe (surrounded by running water) into the sulphur box, the quantity of fumes being regulated by a steam jet which enters the escape pipe at the top of the sulphur box. After the juice is bleached it enters a second juice tank from which it is directed into one of the two defecators placed on what might be called the third floor of the building (the sulphur box is set on the joists.) These defecators are provided with steam coils and here the juice is heated and the blanket of impurities which rise to the top is brushed off into a trough extending entirely around it. Milk of lime is then added about to the point of neutrality as determined first with litmus paper and later by the eye and the cleaning continued by brushing off impurities which rise to the surface. After the juice is so clean that no particles are seen coming to the surface as the boiling goes on a little "clariphos," a preparation of phosphate of lime, is added at the rate of from one-half to one gallon—diluted with several times this much water—for each one thousand gallons of juice. This juice is then drawn off into settling tanks placed to one side of the building and just a little lower than the defecators. This clariphos precipitates any excess of lime that may have been added and carries down with it a quantity of other impurities. After settling for at least two hours this juice is then drawn into the evaporator placed on a still lower level, where the cleaning process is continued and it is finally brought to the consistency of syrup as determined by the Beaume hydrometer

or saccharimeter which should indicate a gravity of between 33 and 34 degrees.

The steam is then quickly shut off and the syrup turned into a cypress tank still lower down from which it is drawn into cans, bottles, jugs, or barrels as the case may be.

All the apparatus above described is by no means absolutely necessary to make good syrup. One of the largest syrup makers in this state and perhaps the most successful uses a single evaporator without either defecators or settling tanks. He made this evaporator himself out of cypress wood and the necessary steam coil out of 2-inch galvanized iron pipe cut in lengths to fit the evaporator and connected with return bend elbows. He uses an ordinary siphon jet for pumping the juice, wooden troughs wherever possible for conducting syrup and juice, and wooden tanks entirely for holding juice, skimmings and syrup. In fact, aside from the boiler and engine which he utilizes at times to saw lumber and a cane mill which was bought second hand, this party made everything else about the factory himself. It is an easy matter to make defecators, evaporators, and juice tanks out of wood and we believe them superior to galvanized iron in that they color the syrup less. A convenient evaporator may be made of 2x10 cypress lumber bored with a 11-16 inch ship auger and bolted together every three feet with 5-8 inch iron rods. The factory just mentioned which belongs to the Allen Bros., of Emerald, Miss., has an evaporator made of this material and in this manner. It is ten feet long, five feet wide, and three and one-half feet high, with flanged top on three sides and a trough to catch skimmings on the lower end.

Containers for syrup.—The tin can is the best package for syrup that is to be placed regularly on the market for it is cheap, easily handled, and a reliable shipper. There are all kinds and sizes of these cans with soldered tops, screw tops, friction tops, and those that fasten and seal by patent devices. We have found the "Record Patent" self-sealing syrup can perhaps the most satisfactory of all. These cans are easy to fill and seal and the tops never push out in shipping as the ordinary friction top cans have been found to do.

The screw top cans are practically as good but the openings are much smaller and it requires more time to fill them. The cans with soldered tops are some cheaper but unless one is fitted up for filling and soldering these cans, they will give a lot of trouble. The friction top cans are also cheaper than the patent and screw top but do not ship well, though for home markets they are alright in every respect.

Bottles are good for fancy trade but are more costly than cans both to buy and to handle. They have to be strongly stoppered else the corks will be pushed out in warm weather even tho no sign of fermentation may be seen in the syrup. Jugs ship poorly and can only be used for the home market. Experience here has been that the barrel, half-barrel or keg will make excellent containers if the syrup can be marketed in fall or winter, otherwise they are not satisfactory, for the syrup in them will ferment with the approach of warm weather. If wooden receptacles are used they should be kept in cold storage until placed with the retailer. The neatness of the package has much to do with the sale of its contents, therefore all syrup cans or bottles should be attractively labeled and securely packed for shipping.

Markets.—There is almost an unlimited market for first class cane syrup that has an established reputation. However, there has been such a lack of uniformity in the syrup placed on the market in this state that at present it is rather a difficult product to dispose of. The station has been able to dispose of the syrup made here directly to consumers in this and other states and to merchants in nearby towns. It would be an easy matter to sell thousands of gallons every month of a good grade of cane syrup put up in quarts, half-gallons, and gallon cans through brokerage and wholesale grocery houses in Hattiesburg, Jackson, Meridian and Birmingham, but the seller of this syrup would have to prove the reliability of his product and be able to keep it up to a certain standard. Syrup sold in this way should net the producer from 30 to 35 cents a gallon which is not a bad price considering the yields that may be made per acre.

Experience here has been that syrup made as above outlined cooked to 33 or 34 degrees and canned and sealed hot will not go to sugar and will keep fresh indefinitely. A certain prejudice exists, however, against the use of any chemical whatever in syrup making and we have made a great deal without using any means of purification whatever other than heat and mechanical processes. The untreated syrup has also kept perfectly and the quality has been good, but it has shown to be darker in color and so far as we were able to judge here the flavor has not been so good. The pure food laws are such that they may decide against the use of sulphur for bleaching and perhaps against lime and clariphos for cleaning, in which event the syrup maker will not be hurt and since all table syrups will be sold on their merit and the consumer will have to be satisfied with a little darker product and perhaps one not quite so palatable.

Mississippi Agricultural Experiment Station.

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BULLETIN No. 130.

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PEANUTS.

BY E. B. FERRIS.

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AGRICULTURAL COLLEGE, MISSISSIPPI

DECEMBER, 1909.



McNeill Experiment Station, Dec. 10, 1909.

Sir:—

I submit herewith manuscript for bulletin on peanuts, being based partly on results obtained at the McNeill Station during the past seven years and partly on results obtained at several other Southern stations. There is quite a demand on the part of the farmers of this State at the present time for information about peanuts and it is hoped that this short treatise will meet their requirements.

Respectfully,

E. B. FERRIS,

Assistant Director.

W. L. HUTCHINSON, Director,

Mississippi Experiment Station.

# PEANUTS.

E. B. FERRIS.

**Introduction.**—The peanut is perhaps our best known nut crop and combines in itself the desirable qualities of several well known farm crops. The portion above ground makes a hay superior to timothy and the equal of red clover, the underground portion a food more nutritious, acre for acre, than the best of our root crops, while at the same time, being a leguminous plant, it builds up the land on which it grows in the same way and to as great an extent as does the cowpea and velvet bean. The peanut is really not a true nut crop, but the so-called nuts are simply pods such as we find on the pea or the bean which develop beneath the ground. It is a crop easily grown, well adapted to the sandy lands of South Mississippi and which may be grown to best advantage on soils of medium fertility.

It is supposed to be of African origin and to have been introduced into this country by the slave traders who used the nuts as a food for the negroes during their passage across the Atlantic. They were first introduced into Virginia and North Carolina where their culture was largely confined until the Civil war when the value of the crop was recognized by the soldiers of the two armies who scattered them widely over the country. They are now grown in thirty-eight states and in commercial quantities in about eight of these states.

Virginia and North Carolina continue to be the leading states in their production, but the chances are that the growth of the crop will be greatly increased in the other Southern states following the boll weevil and the diversification of crops that it forces upon us. Statistics show that in 1905 there were marketed in this country about 14,000,000 bushels valued at \$10,500,000.00 and that about \$150,000.00 worth of these were imported, largely from Spain, China, and Japan.

**Varieties.**—There seem to be two types of peanuts catalogued by seedsmen, the large type used by confectioners and peanut vendors and represented by "Virginia White," "Virginia Red," "Tennessee White," and "Tennessee Red," and the small type used largely as a stock food and represented by the Spanish peanut. This division, however, is purely arbitrary, for the large nuts are frequently used as a food for stock and the small nut as a delicacy for man. The larger kinds are more apt to grow with spreading branches which lie

flat on the ground and produce nuts throughout the entire length while the smaller, or Spanish nut, grows erect and the nuts are closely clustered about the stem and nearer the surface of the ground. The large nuts are more select in their soil requirements and more apt to produce "pops" or faulty pods where conditions are not just right. As a rule the small nut is a heavier and much more reliable fruiter, being adapted to a wide range of soil conditions and practically as cosmopolitan as the cowpea.

This station has grown the large "Virginia White" nut for several years and has found it to have a decided tendency to produce faulty pods, some seasons more than half the pods having no nuts in them. This variety has always made a large growth of vines with many pods on them, and some years these pods have been well filled. In 1905 the large variety made a yield of 98.6 bushels of nuts and 3,521 pounds of hay per acre while the Spanish variety made 80 bushels of nuts and 1,760 pounds of hay per acre when both were fertilized alike and grown on land of the same quality. A bushel of the Virginia peanuts weighed twenty pounds and of the Spanish variety, twenty-two pounds.

**Soils.**—When grown for the confectioner or for roasting, peanuts demand a light sandy soil free from an excess of organic matter or from excessive coloring matter of any kind, for the reason that the pods will partake of the color of the soil and fail to meet the demands of the trade. An ideal peanut soil should not only be physically as described above, but should have a fair percentage of lime so as to make it friable and less inclined to produce unfilled pods. In the absence of a natural supply of lime a top dressing of agricultural lime at the rate of 1,000 pounds or more per acre will have a decidedly helpful tendency. The Spanish peanut, however, will grow successfully on almost any well drained soil in this state and we do not hesitate to recommend it.

**Preparation of soil.**—Land for peanuts should be prepared about the same as for corn or oats, which means that it should be flat broken to a medium depth and thoroughly pulverized with disc and smoothing harrows. Owing to peculiar weather conditions in this immediate section we prefer to plant peanuts in June rather than in April for the reason that weather conditions are usually more favorable for harvesting the late than the early crop. At this station they fit nicely in a rotation with oats and we prefer to have them follow the crop for several reasons. Wherever planted, the land should be pre-

pared as just described, laid off into rows  $2\frac{1}{2}$  to 3 feet apart, the fertilizer, if used, distributed in the drill and mixed with the soil and the nuts dropped by hand or machine and covered from one to two inches deep. The large nuts are usually shelled before planting and may be dropped by hand or by an ordinary corn planter, but the small Spanish nut is more often planted by hand with the pod intact. At this station we never shell the small nut at all, but soak them in water from 36 to 48 hours before planting and drop them by hand, one good pod to the hill, and these hills ten to twelve inches apart. They are usually covered with a bull tongue and this is followed shortly before the plants appear with a smoothing harrow or preferably a weeder to smooth the land and kill young weeds and grass. The young peanut plant is very brittle and will not stand broadcast harrowing after they are up.

**Fertilizers.**—The McNeill station has conducted a number of experiments with fertilizers under peanuts and these have led to the conclusion that acid phosphate alone on the soils here give the cheapest increase of crop. The peanut, being a leguminous plant, does not require a nitrogenous fertilizer and experience here covering many years has gone to show that these soils are not lacking, as yet, in potash. The following figures giving results of work with fertilizers under peanuts in 1905 are typical of all other fertilizer tests with this crop that have been made here, as may be seen by reference to work with peanuts reported in bulletins 79, 83, 87 and 94 of this station: no fertilizer, 1,472 lbs.; 50 lbs. nitrate of soda, 200 lbs. acid phosphate, and 100 lbs. kainit, 1,760 lbs.; 200 lbs. acid phosphate and 100 lbs. kainit, 1,792 lbs.; 200 lbs. acid phosphate, 100 lbs. kainit and 1,000 lbs. lime, 2,016 lbs.; 200 lbs. acid phosphate, 1,760 lbs.; 100 lbs. kainit, 1,680 lbs. The above results were obtained on plats of 1-16 acre each and have been calculated up to the acre as a unit.

In other tests here with peanuts reverted phosphoric acid has given as good yields as the water soluble. The yield of peanut hay has varied with the fertilizer applied, running from 1,000 lbs. to 3,000 lbs. per acre. As a rule the more highly nitrogenous fertilizers give a slightly heavier yield of hay but not of pods. These fertilizers have usually been applied in the drills shortly before the nuts have been planted and an ordinary fertilizer distributor has generally been used for putting it out.

**Cultivation.**—The cultivation of the peanut does not differ materially from that given cotton or corn. It should commence even



before the plants show above the ground so as to prevent the crusting of the soil above the nuts as well as to keep down weeds and grass. An ordinary weeder is an excellent implement for this early cultivation and the expense of running it over an acre of ground amounts to almost nothing. After the young plants show above the ground weeds and grass should be kept down and a dust mulch maintained by frequent shallow cultivations with ordinary side harrow or cultivator. Of course these implements should never be run close enough to disturb the root development and care must be taken not to cultivate close up to the plants after they begin fruiting. Some good authorities advocate giving the last cultivation with a small turn plow and throwing the dirt to the plants, but we believe the consensus of opinion is that all cultivation should be flat. The old practice of throwing dirt on top of the vines as they go to fruit not only is expensive and does no good, but is positively injurious according to the best authorities.

**Harvesting.**—As a rule peanuts must be harvested promptly when they reach maturity or before frost falls on them, else the vines will quickly lose their leaves and become useless for hay and the stem which connects vine to pod will break off and the pods cannot easily be gotten out of the ground, besides if the nuts are left in the ground for any length of time after ripening, they are apt to sprout, especially if the weather is damp. The Spanish peanut is much more easily harvested than the larger kinds, practically all of the pods being removed from the soil when the vines are pulled up, even though nothing has been done to loosen them in the ground.

The large or white peanuts are usually harvested about as follows: a plow is first run on both sides of the row cutting the roots but carefully avoiding breaking the pods from the vines or of covering the vines with dirt. Dry weather is absolutely necessary for this work. Hands follow quickly behind the plows picking up the vines and shaking off the dirt. They are allowed to wilt for six or seven hours when three or four rows are thrown together and finally stacked for curing.

One of the best methods of curing them is to stack them around poles seven or eight feet high placed securely in the ground and so distributed over field as to accommodate the crop. A platform of old rails or brush is then made around each pole so as to keep the vines off the ground and give a free circulation of air under them. The peanuts are stacked so as to have the vines on the outside and the nuts next the pole, being careful to leave enough space around the pole that air can circulate freely. The stacks are then capped with a grass

hay or corn fodder and left for about a month when the nuts should be dry enough to gather, which may be done in the field, or preferably, the vines hauled to the barn and the nuts picked off or whipped off at odd times.

 At the McNeill station we grow the Spanish peanut almost entirely and seldom gather the nuts in any quantity, letting the hogs do this after first cutting the vines for hay, or possibly having them grazed off by cattle. When saved at all the nuts are pulled up by hand without any preliminary loosening of the soil, turned upside down on the row and allowed to wilt for half a day, or such a matter, and then raked into windrows with a hay rake where they are allowed to cure, preferably in small cocks. If the weather is threatening they are hauled to sheds and scattered over poles or pieces of lumber where curing is completed in the shade. Peanuts saved in this way are either fed to stock without picking off the pods, or else the pods are picked off and sold for seed or used for planting succeeding crops. We have found an active demand for peanut seed at from \$1.25 to \$1.50 per bushel.

**Yield.**—The yield of peanuts varies from twenty-five to one hundred and fifty bushels per acre, the Spanish variety as a rule being heavier and surer bearers than the larger kinds. At the McNeill station we have made an average yield with Spanish nuts of approximately 1,640 pounds of nuts and 2,452 pounds of hay per acre and a single result in weighing the large “Virginia White” peanut gave a yield of 1,792 pounds of nuts and 3,520 pounds of hay per acre. The large peanut, however, has not proven a sure bearer here at all seasons, there being times when more than half the pods were faulty. This station grows peanuts in considerable quantities every year for hogs, and, in using the crop for hogs it is very necessary that they should be grazed off promptly when about mature, for, unlike the chufa, they sprout in the ground and quickly lose their feeding value. On this account largely, we regarded the chufa as superior to the peanut for several years, but in later years insects have so depredated on the chufa as to make it less desirable than the peanut, for so far these have not been attacked by any serious diseases or insect pests.

**Uses.**—Peanuts are used in a great many ways. Their sale as parched nuts will reach an enormous total, for they are sold on almost every corner in the large cities, by the fruit and candy shops everywhere, while the small boy cries them on all occasions where more than two or three persons are gathered together. They enter largely

into the recipes of the confectioner and when parched and salted make a cheap and satisfactory substitute for the almond. Peanut butter is a new article of commerce and promises to be very popular. A valuable oil is made from this nut that is used largely as a substitute for olive oil, the cheaper grades being used for making fancy soaps. The shelled nuts yield about forty per cent of oil and as some 94% of the pod is represented by the nut, it can easily be seen that a bushel of nuts weighing 22 pounds would yield about  $8\frac{1}{4}$  pounds of oil or a little more than a gallon per bushel. Peanut oil is manufactured around Marseilles, France, largely from nuts grown in Africa, India, and Spain, but as yet has never been made to any extent in this country. One attempt to manufacture the oil in the United States is reported in Bailey's Cyclopedia of American Agriculture, the result being without loss but with not sufficient profit to warrant its continuance. Perhaps in the cotton belt, especially following the boll weevil, peanuts will finally be substituted for cotton to a certain extent when the oil mills already in existence will find it to their advantage to manufacture peanut oil as well as cottonseed oil.

As a stock food the peanut ranks very high indeed, the vines making a hay superior to timothy and equal to red clover, while the nuts are the cheapest producers of pork, acre for acre, in all the list of hog crops. In bulletin No. 143 of the Alabama Experiment Station which gives in detail the results of three years work with producing pork from all kinds and combinations of feeds, the authors have the following to say about peanuts: "As a whole peanut pasture was found to be more useful than any other pasture tried." The same station found that in feeding grain with the several hog crops the average amount of grain required in connection with the pasturage to produce a pound of pork was: 1.77 lbs. with peanuts; 2.30 lbs. with chufas; 2.68 lbs. with rape; 3.07 lbs. with cowpeas; 3.13 lbs. with sweet potatoes; and 3.70 lbs. with sorghum. Similar tests at the Arkansas station and reported in bulletin No. 73 show that one-fourth of an acre planted to peanuts produced 313 lbs. of pork as compared to 109 lbs. from a plat of the same size planted to corn. Peanuts make a highly nitrogenous feed, not properly balanced when fed alone, and they should always be used in connection with corn for best results.

The following tables taken from Bailey's Cyclopedia of American Agriculture show the feeding value of peanut hay as compared to other standard hays and the composition of the several parts of the peanut plant with reference both to its feeding and fertilizing values:



**Feeding Value of Peanut Hay as Compared with Hay of Other Crops.**

|                   | Moisture | DRY MATTER. |       |                    |                |              |
|-------------------|----------|-------------|-------|--------------------|----------------|--------------|
|                   |          | Protein     | Fats  | Carbohy-<br>drates | Crude<br>Fiber | Crude<br>Ash |
|                   | %        | %           | %     | %                  | %              | %            |
| Peanut hay .....  | 7.83     | 11.75       | 1.84  | 46.95              | 22.11          | 17.04        |
| Peanut vine ..... | 6.25     | 13.48       | 15.06 | 36.28              | 29.16          | 6.02         |
| Clover hay .....  | 14.30    | 12.84       | 2.11  | 48.31              | 29.27          | 7.47         |
| Timothy hay ..... | 13.50    | 7.17        | 1.97  | 52.94              | 33.41          | 4.51         |
| Cowpea hay .....  | 10.29    | 19.72       | 4.04  | 45.15              | 21.99          | 9.10         |
| Alfalfa .....     | 6.95     | 16.48       | 2.02  | 42.62              | 31.38          | 7.49         |

**Average Composition of the Food Constituents in Different Parts of the Peanut Plant.**

| PEANUT.                          | IN WATER-FREE SUBSTANCE. |       |               |       |                               |       |               |
|----------------------------------|--------------------------|-------|---------------|-------|-------------------------------|-------|---------------|
|                                  | Water                    | Ash   | Pro-<br>tein. | Fiber | Nitro-<br>gen free<br>extract | Fat   | Nitro-<br>gen |
|                                  | %                        | %     | %             | %     | %                             | %     | %             |
| Kernels .....                    | 7.85                     | 2.77  | 29.47         | 4.29  | 14.27                         | 49.20 | 4.67          |
| Vines cut before blooming ....   | 31.20                    | 10.64 | 12.63         | 22.32 | 48.34                         | 6.07  | 2.02          |
| Vines cut when fully ripe ....   | 31.91                    | 12.08 | 10.81         | 32.28 | 39.81                         | 5.02  | 1.73          |
| Hay .....                        | 7.83                     | 17.04 | 11.75         | 22.11 | 46.95                         | 1.84  | 1.88          |
| Vines without leaves .....       |                          | 8.80  | 6.25          | 32.95 | 49.49                         | 2.50  | 1.00          |
| Leaves .....                     |                          | 10.90 | 10.00         | 21.51 | 54.09                         | 3.50  | 1.60          |
| Roots .....                      | 28.74                    | 9.58  | 7.63          | 48.59 | 31.00                         | 3.20  | 1.22          |
| Hulls .....                      | 12.74                    | 3.39  | 7.22          | 67.29 | 19.42                         | 2.68  | 1.77          |
| Skin (inner coat of kernel) .... | 10.80                    | 5.72  | 25.11         | 20.96 | 26.89                         | 21.52 | 4.00          |
| Meal .....                       | 10.74                    | 5.48  | 52.49         | 5.93  | 27.26                         | 8.84  | 8.40          |

**Fertilizing Constituents in Different Parts of the Peanut Plant.**

|                            | IN THE FRESH OR AIR-DRY SUBSTANCE. |          |               |        |      |              |
|----------------------------|------------------------------------|----------|---------------|--------|------|--------------|
|                            | Water                              | Nitrogen | Phos.<br>Acid | Potash | Lime | Total<br>Ash |
|                            | %                                  | %        | %             | %      | %    | %            |
| Peanut kernels.....        | 6.30                               | 4.51     | 1.24          | 1.27   | 0.13 | 3.20         |
| Peanut vines (cured) ..... | 7.83                               | 1.76     | 0.29          | 0.98   | 2.08 | 15.70        |
| Peanut hulls.....          | 10.60                              | 1.14     | 0.17          | 0.95   | 0.81 | 3.00         |
| Peanut cake (meal) .....   | 10.40                              | 7.56     | 1.31          | 1.50   | 0.16 | 3.97         |

A study of the tables given above cannot fail to impress one with the marked possibilities of the peanut for Southern agriculture. In



many respects it would appear to be superior to the cowpea, the vines making a ration for horses and mules equal to corn and the best grass hay combined, and the nuts, as has been said, a food for hogs that surpasses all other Southern crops in the quantity of pork produced per acre. With its high percentage of oil and extreme richness in protein we see no reason why the crop might not be grown profitably for manufacturing into oil and high grade stock foods. A simple calculation based on the figures given in these tables will show that with the average yield of nuts and hay obtained here, a peanut crop, exclusive of the roots and fallen leaves, stores up in itself 116 pounds of nitrogen per acre. This nitrogen is gotten almost entirely from the atmosphere, for experiments here have shown that even on the thinnest soils the application of nitrogen in a fertilizer does not give an increase of crop. The greater part of this nitrogen, together with the other plant food elements contained in the crop, may be returned to the soil for succeeding crops even though the peanut crop is consumed by live stock directly or after the oil has been expressed. The nitrogen stored by the peanut is worth just as much as that we pay for in cottonseed meal or nitrate of soda which at present sells for at least twenty cents per pound.

Cowpeas have for a long time been planted almost universally in the South as a means of building and keeping up the productiveness of our soils. They deserve every praise for what they have done and are doing for Southern agriculture, but with us in the pine belt of Southeast Mississippi cowpeas, except on fresh land, fruit so poorly that it is doubtful if by saving all the seed made, we would be able to replant the acreage of the previous year. Velvet beans are fast taking the place of cowpeas here largely on this account. As a soil improving plant the Spanish peanut comes nearer equalling the cowpea at its best than any other crop we can grow. It has a short growing period so that two crops a year may be made, it may be grown in corn as a catch crop if planted and allowed to develop with the corn, detracting very little from the yield of the corn, and the crop is more easily harvested and more relished by live stock than any other hay we can grow save the cowpea.

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Mississippi Agricultural Experiment Station.

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BULLETIN No. 131.

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SNAP BEANS.

By E. B. FERRIS.

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AGRICULTURAL COLLEGE, MISSISSIPPI

DECEMBER, 1909.

MCNEILL EXPERIMENT STATION,

December 20, 1909.

SIR:—

I submit herewith manuscript for bulletin on snap beans with the hope that it will meet the demands of a number of prospective truckers in this state who apply to the stations for information about trucking and truck crops. The boll weevil has done more to convince the farmers of this state of the necessity for diversification than all the other influences that have been brought to bear and they are now on the alert for promising crops that may be grown in place of cotton and want primary information about them.

Respectfully,

E. B. FERRIS,

Assistant Director.

W. L. HUTCHINSON, Director,

Mississippi Experiment Station.

SNAP BEANS.

E. B. FERRIS.

Introduction.—The following short treatise on snap beans is hoped to be the first of a series of its kind dealing with truck crops and based on the results of experiments that have been conducted at the McNeill Branch Station since 1902 in growing and marketing these crops. South Mississippi offers an attractive field to the trucker so far as natural advantages are concerned, having a soil almost physically perfect, a climate almost ideal, and, in many places, railroad facilities for placing the crops grown on the best markets of the country. It lacks the necessary labor for developing the industry, while the soils, which are generally poor from a chemical standpoint, have first to be built up to where most truck crops can be grown successfully.

Truck growing is quite a specialized industry, requiring more skill, if not more intelligence, on the part of those engaged in it than any other line of agriculture save, perhaps, the dairy business and experience here has been that the two may be operated together most successfully, the dairy cattle furnishing manure for building up the soils most economically and giving a market not only for the surplus truck crops themselves, but for restorative crops that should follow them. Trucking is at once capable of earning large profits for the successful individual or of causing equally as large losses to the unsuccessful, and the best of its followers are not exempt from frequent failures with a single crop. Except in rare instances the truck grower has to produce extremely perishable crops for limited markets in competition with a vast territory on all sides, and unless conditions beyond his control such as are determined by the soil, climate, and transportation facilities are suitable he cannot hope to succeed except at a great disadvantage. Under the most favorable circumstances it will require a knowledge of soils and fertilizers, of controlling insect pests and fungous diseases, and of the intricate matter of packing and distributing the products, that the producer of staple crops can only acquire by experience, and the writer believes it best to begin such work gradually. In fact, a practical understanding of all the sciences underlying agriculture in its broadest sense would hardly suffice to make one proficient in this work without the knowledge that comes with experience in growing and marketing such crops.

A large percentage of the soils of South Mississippi are light sandy loams with sandy-clay subsoils and not only mature the crops grown on them in a minimum length of time, but are capable of a high degree of improvement with a combination of animal manures, commercial fertilizers, and restorative crops. On such soils the trucker may reasonably expect to get his products on the highest priced markets

in the early spring, while at the same time climatic conditions here are such that he can raise the most of the standard truck crops in the fall and a number of them through the winter. Thus at McNeill early crops like beets, beans, cabbage, Irish potatoes and tomatoes are off the land by the middle of May, being followed by a number of staples such as corn, cowpeas, peanuts, and the like which in turn mature in time for fall and winter crops of many kinds. This station is now marketing, on December the twentieth, several acres of cabbage which are as fine as have ever been grown here in spring, and has altogether numbers of acres of rape, rutabagas, collards, beets, turnips, onions and grain crops which not only supply the surrounding towns with their produce, but furnish succulent feed for dairy cattle through the winter months.

The bush or snap bean is perhaps the easiest of all truck crops to grow and there is about as little experience necessary on the part of the producer. They do not require so rich a soil as do the most of the other truck crops, though they respond well to good fertilization. Being easy to plant, cultivate, and prepare for market, and requiring a minimum of expense for seed and fertilizer, they are an especially good crop for the beginner, and experience here has been that they are about as reliable as any for net returns.

Soils.—For early markets this crop requires a well drained sandy-loam soil which dries out and warms up early in the spring and brings the beans to the shipping stage in the shortest possible time. Such a soil is preferable to stiffer lands that might make much heavier yields but mature them a few days later, since a week's difference in the time of marketing such crops frequently makes the difference between profit and loss.

Preparation.—The first essential in growing most truck crops is to get a lot of humus, or partially decayed organic matter, into the soil and this can be best accomplished here and elsewhere by turning under leguminous crops like the velvet bean or better the manure from cattle that have grazed these beans. Here it is thought best to flat break the land for beans first and then pulverize same thoroughly with harrows, later laying off the ground into rows from two and one-half to three feet apart and distributing the fertilizer in the drill. The beds are then completed and later knocked off with drag or harrow to where they are only slightly higher than the average surface of the ground. This elevation is necessary because the beans are necessarily planted very early when, if drainage is poor, excessive rains are apt to rot them in the ground. The crop can be planted in very narrow rows but those three feet apart are to be preferred for field culture on account of being easier to work with ordinary farm implements. With

the ground prepared as above outlined the beans are planted with an ordinary corn planter with special bean plate or disc, or else the rows are opened with bull tongue and the beans dropped by hand three inches apart and covered about two inches deep. Ordinarily it requires from 5-8 to one bushel of beans to plant an acre, the quantity being determined both by the variety and by the width of the row. It requires, for instance, considerably more of the wax beans than of the green podded Valentine to plant a given area on account of the relative sizes of the beans in each.

Time to plant.—As a rule the earliest beans bring the best prices and every effort is usually bent towards getting them on the market at the earliest time possible. Experience here has been that beans planted the first of March will not likely be killed by frost though there may be light frosts after this time. Some of the most successful crops ever grown at McNeill have been planted considerably earlier than this but at the risk of being killed by cold.

Varieties.—The two varieties grown mostly by truckers in this section have been Wardwell's Kidney Wax and Improved Valentine, the first having a yellow pod and the last a green pod. Of these two the wax is about a week earlier, being ready for market in about fifty days after planting. The green bean has averaged yielding perhaps ten bushels more per acre and when both have been grown to perfection, the wax beans have sold for better prices and have been a lot easier to pick on account of the larger pods. Some of the earliest wax beans grown by this station have sold for as much as \$3.50 per bushel hamper on the Chicago market, though, of course, this was an exceptionally high price. Up to 1904 the wax beans did remarkably well here but since that time anthracnose, or rust of the pods, has been so prevalent that they cannot be grown at all and the truckers have about discontinued planting them, depending entirely on the round podded green Valentine.

Though the Wardwell Kidney Wax bean has a flat pod and sells well on the markets, experience here has been that green beans with flat pods will scarcely sell at all and we would caution the truckers of this section against them. Other standard varieties of beans that might be expected to do well here are Black Valentine, Early Refugee, Stringless Green Pod, and Dwarf German Wax.

Fertilizers.—The bean does not require an excessively rich soil and has much to recommend it in this respect for the newly cleared lands of South Mississippi. In fact, this station made one of its most successful bean crops in 1902 on land that had been cleared only a few days before and from which the stumps had never been removed. While the bean is a leguminous crop, when grown for northern markets

it is planted so early in the season that we cannot depend on its getting its entire supply of nitrogen from the air. This station has conducted a number of tests with fertilizers under beans covering at least seven years, and a number of these have been reported in detail in bulletins 79, 83, 87 and 94 of this station, and the following table gives the results for 1906 and 1908, the experiment in 1907 having been entirely upset by a small white grub that hatched in the seed bean when planted and prevented germination:

Results with Fertilizers Under Beans, 1906 and 1908.

Number of Plat.	Cottonseed Meal—Lbs. per acre.	Nitrate of Soda—Lbs. per acre.	Acid Phosphate—Lbs. per acre.	Kainit—Lbs. per acre.	Yield of Beans in lbs. per acre 1906.	Yield of Beans in lbs. per acre 1908.
1.....	224	112			2320	5180
2.....			512		2608	2890
3.....				480	1744	2720
4.....	224	112	456	200	3920	4680
5.....	224	112	456		3744	5540
6.....			512	480	1904	
7.....	224	112		200	2592	4540
8.....	56	28	114	50	3312	3800
9.....						2240
10.....	224	112	250			5140
11.....	100	50	500			3950

From our entire experience here we would recommend a fertilizer for beans made about as follows: 125 pounds of cottonseed meal (or some carrier furnishing an equal quantity of nitrogen), 62.5 pounds of nitrate of soda, and 250 pounds of acid phosphate mixed together and applied in drills to an acre of ground shortly before planting the beans. The nitrogen of the nitrate of soda will feed the young bean while that of the cottonseed meal will feed the plant later. Really it would be better to apply the acid phosphate in such a mixture a few weeks earlier than the other ingredients provided the risk of having it washed off over the surface is not too great. An average of all results here would perhaps show that the addition of kainit to such a mixture has tended to lower rather than increase the yield of beans.

Cultivation.—After the beans are planted care should be taken to prevent a hard crust forming over them in case of heavy rains before the young plants show above the ground. When such a thing happens it is necessary that a light harrow or weeder be run over the ground to break this crust. After the beans are up the cultivation should be level and shallow and frequent enough to keep down weeds and grass and maintain a dust mulch. There is really slight difference between the cultivation of this crop and that of corn or cotton. Care should be taken not to cultivate beans while the vines are wet from rain or

dew, as this will cause dirt to stick to the leaves and they will have a tendency to develop disease.

Gathering.—The standard varieties of snap beans are ready to pick in from fifty to sixty days after planting. As stated before the wax bean has larger pods and is easier to pick than the round green bean. When ready to gather a lot of extra labor, consisting of men, women and children are usually put in the field after the dew has dried off each with a picking basket holding one-half bushel. As fast as these baskets are filled the beans should be poured into the hampers in which they are shipped and removed to the shade. A good hand should pick ten bushels or more a day and the price paid here for the work is from ten to twelve and one-half cents per bushel. Only the well developed pods should be picked and these should be tender enough to snap easily. As a rule it requires three or more pickings to gather the crop.

Packages.—Beans are shipped in boxes or hampers holding about a bushel each. For a long time the box was the standard package, but in recent years the hamper has almost entirely taken its place, the best markets frequently quoting beans in hampers at twenty-five cents more per bushel than in boxes. With beans, as with all other truck crops, care should be taken to ship only the best and if the markets are such that we think it advisable to ship poorer grades, let them be separated from the best and if possible under a different name. The hampers are easily packed, about the only precaution necessary being to see that they are well filled. With the boxes it is necessary to use much greater care in placing the top and bottom layers so as to have them show up well on the market.

Shipping.—Beans are quite perishable and must always be shipped by express or refrigerated freight. The earliest beans will always be shipped by express and the prices will usually justify the increased cost, but the bulk of the crop is nearly always sold at a price that will pay little more than express charges. The express rate to most of the best markets in reach of this territory varies from \$1.25 to \$1.75 per 100 pounds or from forty to sixty cents per bushel. Beans frequently sell for \$1.00 a bushel or less, when if shipped by express they net the grower about enough for package and picking, whereas if shipped by refrigerated freight they will net enough to make the growing of them profitable. Ordinarily, about six hundred hampers are put into a car, and if the crop is reasonably good they should yield from fifteen to forty hampers at each picking, so that if as many as forty acres are grown in a community there should be no trouble about shipping the bulk of the crop by freight. In fact, beans, cabbage, and Irish potatoes are usually marketed about the same time and mixed cars of the three crops might easily be made up.

Diseases.—With the exception of 1907 when the beans were attacked in the ground by great numbers of small maggots that must have hatched out in the seed after planting, the crop here has been peculiarly free from serious damage by insect pests, much more so than a majority of other truck crops that have been tried here, but it has been seriously affected by anthracnose or cankers on the pods, a fungous disease quite hard to control. This disease has been so bad at McNeill in recent years as to cause the complete abandonment of the wax bean which variety seems to be much more liable to it than the green bean. A great deal of work has been done by the Experiment Stations of the country trying to find a remedy for this disease and it has proven a difficult one of solution. The conclusions arrived at have been that in order to control it the pods must be selected in the field each year and only those used for planting the next crop which show up free from any appearance of the disease, the beans from such pods having always been found free from the disease.

In addition to this the beans should be planted in bunches in the field and these clusters not allowed to touch each other in drill. The cultivation of the crop while the dew is on or the vines wet from rains also has a decided tendency to spread the disease. While some claim to be able to check it by spraying with Bordeaux mixture, results at McNeill have shown very little benefit from it. Wax beans planted here in 1905 and carefully sprayed twice during the growing period were so badly infested that when shipped they practically rotted before reaching the market although they had been carefully sorted before leaving here. The careful grower who will select his seed against this disease will surely make the growing of wax beans for Northern markets a profitable business here for they have always been the most popular bean for the very early market. The green beans are grown here with very little trouble from this anthracnose.

Conclusion.—The snap bean occupies the land less than seventy-five days and being planted on or near the first of March is out of the way before the middle of May so that it really interferes very little with the growing of ordinary farm crops. Like all truck crops it is very uncertain as to just what to expect in the way of net returns, but experience here has been that it is not any more uncertain than cabbage or Irish potatoes, besides being a cheaper crop to grow. In 1904 the station kept records of the returns from two acres planted to beans and received for them \$173.30, shippers net, that is after freights and commissions had been deducted. One year later when about the same acreage was planted, largely to wax beans, the anthracnose was so bad that only a few hampers were shipped at all and these sold at a loss.

Mississippi Agricultural Experiment Station.

BULLETIN No. 132.

JANUARY, 1910.

SOILS OF MISSISSIPPI.

BY W. L. HUTCHINSON.

SOIL MANAGEMENT.

The problem of good land is a most important one to any state or nation and to present as well as future generations. Farm practices that result in lessening the productiveness of land are unnecessary and undesirable and for a people to have the habit of following such practices is most unfortunate. Land can be improved and its productiveness increased just as easily as it can be worn out or its productiveness decreased and whether it takes the one course or the other depends entirely on the farmer and what he does. Mississippi farmers have grown up with the idea that cultivated land must needs wear out and be abandoned for nature to again make it fit for cultivation. They have passed from youth to old age and have seen this thing obtain and they are disposed to accept it as a matter of fact. And a farmer, like faith, "when once wedded fast to some dear falsehood hugs it to the last."

The annual tax.—One crop for this state represents a value of at least one hundred million dollars. By drainage and tillage Mississippi farmers could, in one year, double their present crop so that the tax they now pay for poor drainage and indifferent tillage must needs be one hundred million dollars annually.

Properly managed, soil may be cultivated forever and be better at the end than it was at the beginning. Good farms are made by those who manage them—new farms are not the best farms. Farming should be conducted on the basis that the value of the farm would increase with the centuries. Some spot or part of the farm may be made better each year. It usually takes a century of good management to make a good farming country.

Five things to do: (1) So drain the land that water will not stand on or near the surface; (2) Practice good tillage; (3) Prevent uplands from washing; (4) Keep an adequate supply of humus in the soil; (5) Make the farm attractive and even beautiful.

Drainage.—Last year (1909) water standing on or near the surface, during seasons of excessive rain, caused thousands of farmers to fail with their crops. The excess of this injury, over what it is normally, amounted to one-third of a normal crop—the money value of the shortage would have been about forty million dollars. This simply represents the excessive damage for an abnormal season. A better idea of the total damage may be had from the following data: The Delta Station owns and farms 200 acres of land on Deer Creek. This land had been in cultivation for nearly a century prior to the establishment of the Station. The practice had been to plant nearly all the farm in cotton and a yield of sixty bales for the farm was regarded as very satisfactory. The Station plants about ninety acres in cotton each year and has averaged, each year, a bale to the acre. Some simple, inexpensive surface drainage was mainly responsible for the increase in yield, which was certainly more than double what it had been. Similar injury, or lessening of yield, occurs on a majority of the farms in this state because of standing water on or near the surface during periods of excessive rain. The necessary drainage to prevent such injury could be had as easily as it was obtained at the Delta Station.

Any farmer can drain his land and, when he is looking for some means to increase the productiveness of his farm, and, also, the profits derived from it he may begin draining every place where water stands on or near the surface during wet weather. The trouble is not that the farmer cannot but because he will not. Standing or gravitation water should not be nearer than three feet of the surface.

Open ditches, properly made, may be used for most of the drainage but on every farm there will be cases where covered drains will serve better. Every farmer knows how to make a blind ditch and when properly placed they may be very valuable.

Open ditches for drainage should not be made with a spade. They should be several times wider at the top than at the bottom, thus giving the sides a very gentle slope. They are easily made with teams, plows and scrapers, or, with road machines. On many plantations a road machine could be made one of the most useful implements on the place.

A great many farmers could do more or less tile drainage each year. After seeing tile properly laid a farmer may put in his own tile and the cost for the tile would only be about \$100 a mile. By putting in one mile of tile each year the problem of drainage would soon be solved on the majority of farms.

Standing water not only injures the growing crop, (as so many farmers believe) but it injures the land as well. To get only half a crop a year, and some years not even that much, is a heavy tax to pay for indifference as to those things that determine the yields of crops.

Tillage.—As generally practiced in this state, the tillage is not good. The plowing is not good; the harrowing is not good; the cultivation is not good. And yet, good tillage is a simple matter when you have good implements and plenty of teams. But good judgment is necessary in order to secure good tillage economically.

The farmer may not say that any old condition of the soil is equally good for growing crops. He knows that there is one condition that is better than all others and yet he does very little with a view to keeping his land in this best condition at all times. All crops do best when the soil is fine, moist and mellow. This same condition of the soil is best for seeding. To get the soil in this fine, moist, mellow condition, preferred for all kinds of seeding and by all growing crops, we plow and harrow and cultivate. Rarely should it be necessary for the farmer to cultivate to kill weeds for if he cultivates often enough to keep his soil in the best condition there will be no weeds to kill. (It may be necessary to say to Mississippi farmers that crab grass is their worst weed.) Land may be plowed for the purpose of turning under organic matter.

If land is plowed six inches deep it is well plowed. If the plowed land is harrowed until it is free from lumps and is fine, moist and mellow it is well harrowed. If the surface be then well cultivated once a week or once every ten days it will keep the soil in good condition for a season.

Rain and grass.—On occasion it rains and it rains so that the weekly cultivation of the surface is interfered with and crab grass makes such growth that the cultivators will not handle it satisfactorily. Crab grass is such a bad weed that it should be killed as quickly as possible and to this end use those implements that will clean the crop in a few days and then resume the frequent tillage of the surface with the cultivators. Crab grass seriously injures crops, hence do not let it grow. Continued rain should be the only excuse for the presence of crab grass in any crop.

The surface soils at the McNeill Station are a sandy-loam. The sub-soils are clay or sandy-clay. Trials were made to determine the influence of deep plowing on these soils. The deepest plowing was eighteen inches and the shallowest, four inches. The depth of plow-

ing did not have any influence on the yield of crops. Both the texture and structure of these soils are naturally good. What these soils need is manure, not plowing, and yet the farmer's thumb rule is: "Plow deep while sluggards sleep and you will have corn to sell and corn to keep."

The clay lands in the state stand more in need of good plowing. The farmer with clay land may plow six inches deep or just as much deeper as he pleases.

Ridge or flat culture.—Ridges or beds are made for drainage and not for any advantages in cultivating the crop that they offer. They are very expensive and exceedingly inconvenient and stand much in the way of good cultivation of the surface but beds are helpful on poorly drained land. The prevalence of ridge culture is merely an indication of poor drainage.

To prevent washing.—As the surface soil is the productive part, and the only part that will grow crops, if this be allowed to wash away as regularly as the rains come it is only a self-evident proposition that such areas will remain unproductive as long as the surface soil is removed by each succeeding rain. No management can make an area productive if the surface is regularly removed by any agency. How patient and tolerant Mississippi farmers have been while water has steadily taken away the productive, and hence the valuable parts of their farms. If any other agency should attempt to take the best part of a man's farm from him he would show enough spirit to object to such procedure, but as the agency is water, he submits without even a protest, but the farmer's easy submission does not lessen the damage. And how great has been this damage in Mississippi!

Terraces and sod.—Upland areas that suffer from erosion may be handled to best advantage by the use of such drains and terraces as will make the surplus or run-off water move s-l-o-w-l-y. Where this does not suffice, a sod must be added.

The fine silt soils of the brown loam region suffer most from erosion. These soils, just after a freeze, behave as though they actually dissolved like sugar and a sod is the only thing that will prevent this action—but even a sod of lespedeza will prevent it. We have had no trouble preventing washing where both terraces and sod were used.

Two systems designed to control surplus or run-off water on upland areas may be described. One system consists of a series of embankments or high beds without any fall or grade except a little at the ends. The rows are, also, without any fall and mainly parallel to the embankments. If a hillside plow, that turns every furrow

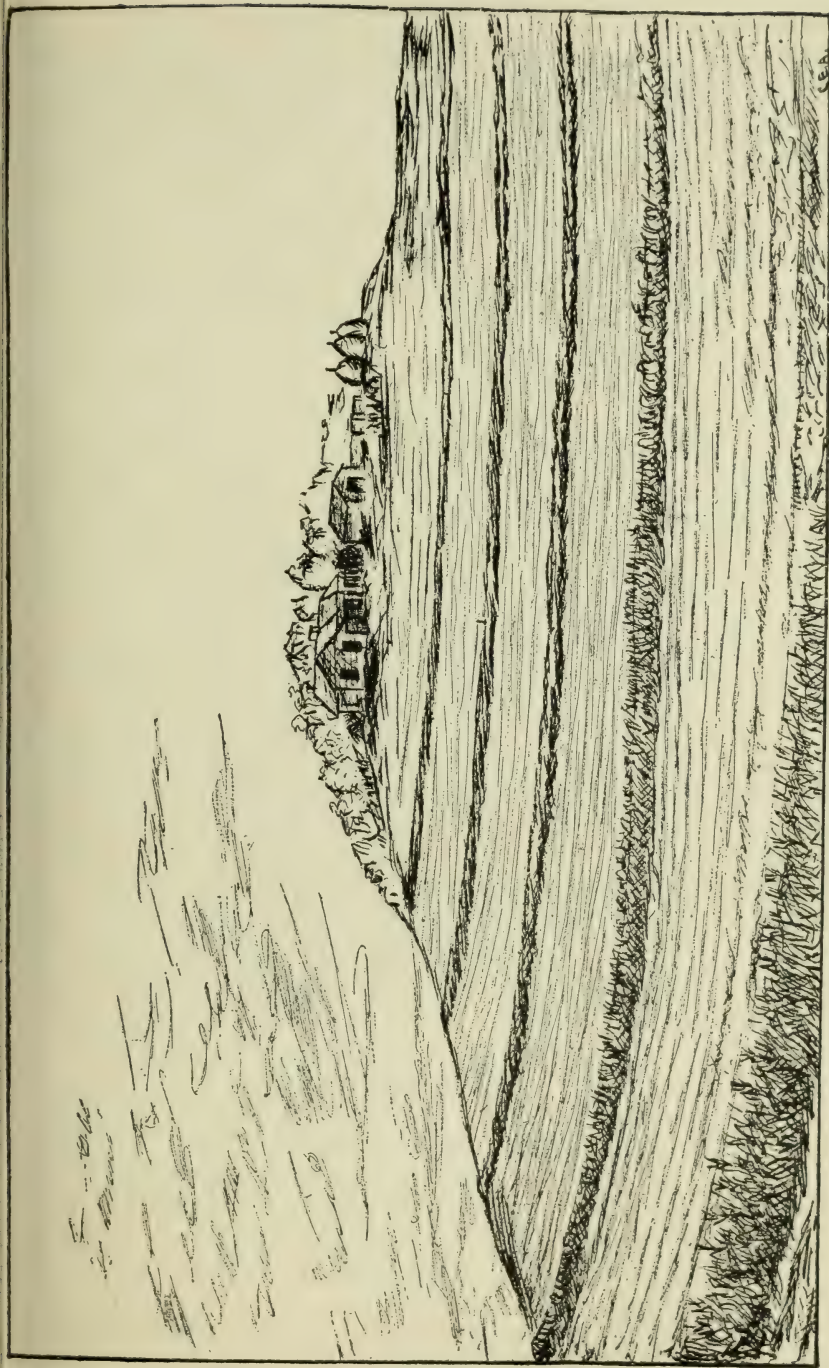


FIG. 1.—SHOWING LEVEL EMBANKMENTS.

down hill, is used in breaking the tendency will be to bring each space between embankments to a level surface. Where each furrow is turned down hill the lower edge of the plat is elevated and the upper edge lowered. A good reversible disc plow makes a splendid hillside plow. See Fig. 1.

A second system consists of broad, well made embankments having a fall or grade of about seven inches in a hundred feet. These embankments should be at least six feet wide. The soil for making the embankments should be taken from the upper side thus making a broad shallow drain or ditch. The rows may best parallel the embankment. This will tend to concentrate the water in the hollows or low areas or where the natural contour of the surface tends to concentrate it. At these points a short cross terrace is made to take the water from the rows and conduct it to the main terrace below. With this system there is no loss of land nor interference with farm machinery and the water can always be made to move s-l-o-w-l-y at every point. See Fig. II.

The perpendicular distance between terraces in the first system is four feet and in the second, eight feet; thus making the level terraces twice as numerous as those having a fall.

The loss of productive soil by erosion has been very great. It means poor land while it continues.

Humus.—Decaying organic matter in the soil is one of the most important ingredients. The natural method of improving soil is to increase the amount of humus in it. The farmer's method for wearing out soil is to lessen the amount of humus in it. It helps the soil just as much for the farmer to add humus to it as it does for nature to add it. The farmer can add humus to the soil just as well as nature and, as is always the case, he can beat nature when he tries. Stable manure makes good humus—better than that supplied by nature.

Organic matter bears about the same important relation to the productive power of soils that the key-stone does to the strength of the arch. The key-stone is always put in the arch.

The amount of sand and clay in a soil may remain fairly permanent, but not so with the organic matter. Farmers that improve soils add organic matter to them. If an adequate supply of humus is kept in cultivated land the farmer must regularly add organic matter as that in the soil constantly diminishes. The failure of Mississippi farmers to give this matter proper attention has not been the least of their many costly omissions.

The use of stable manure and the plowing under of crops or parts of crops is the farm method of adding humus to cultivated

lands. While any organic matter is good some is better than the other. Stable manure and restorative or clover crops are the very best types of organic matter for the farmer to plow into his soil.

A number of restorative crops are available for the improvement of Mississippi soils. We may mention lespedeza, cowpeas, soy-beans, velvet beans, vetch, melilotus, alfalfa, red, white and bur clover.

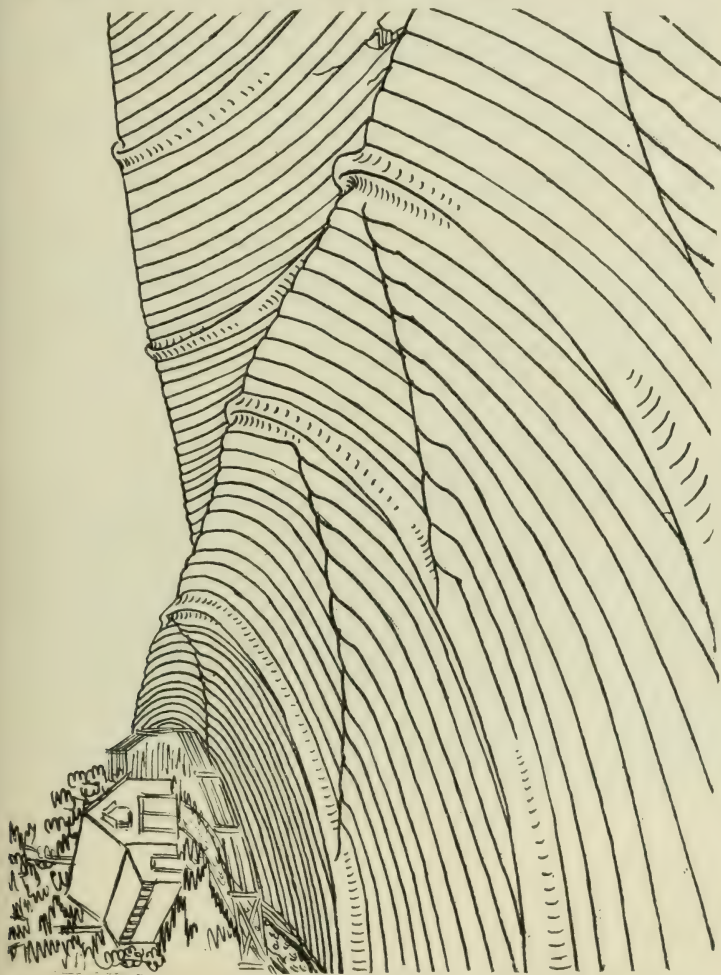


FIG. 2.—SHOWING DOUBLE SYSTEM OF EMBANKMENTS. ALL ROWS AND EMBANKMENTS HAVE SMALL FALL.

Cowpeas, soy-beans and velvet beans may be grown with corn. Vetch may be grown with oats. Cowpeas or soy-beans may be grown the same season after oats. Lespedeza is a great plant for improving soils and is one of the best pasture plants. Melilotus is a valuable

plant on lime soils. Alfalfa grows well on buckshot or black prairie soils and none of the legumes improve the land more.

Cattle fed on cotton seed products produce manure of the greatest value. Indeed everything is favorable for keeping an adequate supply of humus in the soil whenever there is the proper farm management.

The functions of humus are numerous. It has to do with furnishing both food and water to plants. It has to do with germ life in the soil and with the texture and temperature of the soil.

Neatness.—"The apparel oft proclaims the man," and it pays to have a neat farm. A farm that looks like a step child will have scrub stock. It will lack drainage. The tillage will be poor. The uplands will be seamed with gullies. The soils will be deficient in humus. The farmer will buy corn and meat because corn is the basis for hogs and corn will not grow on poor land.

NOTE.—The Mexican cotton boll weevil prefers a neglected farm with cotton as the only crop grown.

Mississippi Agricultural Experiment Station.

BULLETIN No. 133.

INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS

ON SALE IN THE STATE.



CHEMICAL LABORATORY

AGRICULTURAL COLLEGE, MISSISSIPPI

JANUARY, 1910.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



Inspection and Analyses of Feeding Stuffs

BY THE CHEMICAL DEPARTMENT OF THE

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THE INSPECTION —OF— COMMERCIAL FEEDING STUFFS

INTRODUCTION.

This bulletin contains analyses of samples of commercial mixed feeds and feeding stuffs drawn by regular inspectors of the Department. The results of these analyses are sufficient to emphasize the variation in composition of the feeds sold in this state, and every purchaser should examine the analyses in the tables which follow. Feeds are bought for the digestible nutrients which they contain. They should never be purchased simply upon the basis of the price per ton.

It not infrequently happens that buyers select a certain kind or brand of feed when a much better one could be secured for less money. This is due to failure on their part to ascertain the composition of the feed before buying it.

On the purchase of feeds.—All purchases of mixed feeds or by-products should be made upon the basis of actual composition, as shown by the guaranteed analyses or by the analyses given in the publications. The guaranteed analysis is printed on tags attached to the bags or stencilled on the bags themselves. By making an examination of the guaranties of the various kinds of feed which are available, the buyer can readily decide which feed contains the greatest amount of nutrients in a ton. Avoid low grade feeds; they are expensive.

Fat and protein are the most expensive constituent in any feed and those mixtures and by-products rich in these nutrients cannot be sold for a comparatively low price per ton. On the other hand cheap feeds are invariably low in protein and most often in fat also.

The fiber of feeds consists of the woody portion which is not very digestible. A certain amount of fiber is essential, but buyers cannot afford to pay a high price for it, because it can be obtained cheaply.

n common hays, straws, cottonseed hulls, etc. The more concentrated feeds can not contain a high percentage of fiber.

Corn and the cereals generally are rich in carbohydrates. Carbohydrate feeds can be produced on the farm. It is often necessary, however, to purchase by-products, e. g., cottonseed meal, wheat bran, gluten meal, brewers' dried grains, etc., which are rich in protein, that a properly balanced ration may be compounded. The leguminous hays are also comparatively rich in protein and many manufacturers are now securing a large proportion of protein in their feeds from this source.

If the purchaser fails to compare the guaranteed analyses and selling prices of the feeds offered him, he cannot avoid costly mistakes. **He should assure himself that the feed selected at a certain price contains as much protein and fat (and no more crude fiber) as any other palatable and adaptable feed that he can buy at the same price.**

Deficiencies.—The tables of analyses will show that some samples were found deficient. In a number of cases these deficiencies are not great, but this does not apply generally by any means.

A manufacturer who will make an effort to persistently ship feed under his guaranty is not entitled to the confidence of purchasers. The Department will watch closely those brands which have shown deficiencies in the past, and a repetition of these errors will render necessary a strict enforcement of the penalties provided by the feeding-stuff law. Deficient and illegal feed cannot be sold in the State, and while an occasional error in mixing is difficult to avoid, there is no reason why analyses of the samples of certain brands should be found deficient.

Purchasers are strongly advised, therefore, to study these tables and select reliable brands.

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ABBEVILLE RICE MILL OFFICE, Abbeville, La.	
10541	Rice Polish	Hickman Son, Butler & Co., Monticello
10542	Rice Polish	Hartman Merc. Co., Brookhaven.....
		Average
		Guarantee.....
	AMERICAN MILLING COMPANY, Chicago, Ill.	
10543	Sucrene Horse & Mule Feed ..	Capital Grocery Co., Jackson.....
10544	Sucrene Horse & Mule Feed ..	Threefoot Bros. & Co., Meridian.....
10545	Sucrene Horse & Mule Feed ..	C. J. Edwards Co., Vicksburg.....
10546	Sucrene Horse & Mule Feed ..	Merchants Grocery Co., Hattiesburg....
11560	Sucrene Horse & Mule Feed ..	Ball Merc. Co, Columbia.....
		Average
		Guarantee.....
	ARKADELPHIA MILLING CO., Arkadelphia, Ark.	
10547	Bran	Queen City Feed Co., Meridian.....
10548	Bran	Harris & Company, Meridian.....
11268	Western Bran	Wm. Atkinson & McDonald, Wesson
11276	Western Bran	C. F. Nelson & Sons, Goodman.....
11277	Western Bran	Simmons Powers Co., Goodman.....
11299	Western Bran	Hattiesburg Grocery Co., Hattiesburg
11555	Western Bran	W. M. Conner, Hattiesburg.....
		Average
		Guarantee.....
10549	Shorts	Queen City Feed Co., Meridian.....
10550	Shorts	Harris & Company, Meridian.....
		Average
		Guarantee.....
	ARLINGTON ROLLER MILLS, Arlington, Ky.	
10551	Wheat Bran	J. K. Dunn, McComb.....
10552	Wheat Bran	Barrett Grocery Co., Lexington
		Average
		Guarantee.....
	C. BECKER MILLING COMPANY, Red Bud, Ill.	
10553	Wheat Bran	Boyd & Russell, Philadelphia.....
		Guarantee.....
10554	Wheat Shorts.....	S. A. Clay & Son, Stallo.....
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10541	11.39	5.10	8.49	11.44	62.63	.95
10542	11.29	5.48	9.29	11.94	61.31	.69
	11.34	5.29	8.89	11.69	61.97	.82
			6.00	10.00	65.00	10.00
10543	12.16	6.93	4.57	9.63	57.83	8.88
10544	10.34	5.34	4.00	9.25	62.80	8.27
10545	11.45	5.87	3.71	10.13	60.66	8.18
10546	11.03	5.48	3.96	9.19	62.08	8.26
11560	12.14	6.43	3.62	8.75	59.45	9.61
	11.42	6.01	3.97	9.39	60.57	8.64
			3.50	10.00	50.00	12.00
10547	10.81	9.82	3.96	13.38	47.12	14.91
10548	10.39	7.51	3.65	13.00	53.74	11.71
11268	9.25	7.37	2.95	11.19	54.84	14.40
11276	8.85	7.98	2.69	12.06	55.17	13.25
11277	9.54	8.83	3.14	12.44	50.50	15.55
11299	9.17	6.63	2.75	12.38	59.12	9.95
11555	8.60	5.51	2.42	12.19	63.04	8.24
	9.51	7.66	3.08	12.38	54.80	12.57
			3.50	12.00	50.00	12.00
10549	11.59	8.00	3.70	13.56	51.63	11.52
10550	10.55	8.93	3.80	12.94	51.78	12.00
	11.07	8.46	3.75	13.25	51.71	11.76
			3.50	12.00	50.00	12.00
10551	11.48	5.42	4.62	16.00	54.59	7.89
10552	10.70	5.43	5.01	15.25	54.40	9.21
	11.09	5.42	4.82	15.63	54.49	8.55
			4.00	14.00	52.00	9.00
10553	10.16	6.61	4.55	14.63	55.51	8.54
			3.58	14.50	52.00	10.00
10554	11.06	4.62	5.01	16.25	57.38	5.68
			4.20	15.50	60.30	3.70

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	THE BLAIR MILLING COMPANY, Atchison, Kansas.	
10555	Bran	Threefoot Bros. & Co., Meridian..... Guarantee.....
	BLOOM'S SON COMPANY, New Orleans, La.	
10556	Rice Bran	J. K. Henley, Biloxi..... Guarantee.....
	E. C. BUCHANAN & COMPANY, Memphis, Tenn.	
10557	Bran	C. M. Elder, New Albany..... Guarantee.....
10558	Shorts	C. M. Elder, New Albany.....
10559	Shorts	J. R. Buchanan, Sardis..... Average..... Guarantee.....
	BROWDER MILLING COMPANY, Fulton, Ky.	
10560	Wheat Bran	W. A. Bray, Winona.....
10561	Wheat Bran	J. J. Heyers, Corinth.....
10562	Wheat Bran	Merchants Grocery Co., Crystal Springs..... Average..... Guarantee.....
10563	Mixed Feed	C. A. Turner, Corinth..... Guarantee.....
	CAPE COUNTY MILLING CO., Jackson, Mo.	
10564	Wheat Bran	E. Bonelli, Vicksburg..... Guarantee.....
10565	Mill Run Mixed Feed	Hanes & Hood, Vicksburg..... Guarantee.....
10566	Shorts	Hannah Distributing Co., Jackson..... Guarantee.....
	CAPITOL GRAIN & MILLING CO., Nashville, Tenn.	
10567	Alfacorn	Biloxi Milling Co., Biloxi.....
10568	Alfacorn	Merchants Grocery Co., Hattiesburg.....
10569	Alfacorn Feed	Merchants Grocery Co., Brookhaven.....
10570	Alfacorn Feed	D. W. Wilkinson & Bro., Jackson..... Average..... Guarantee.....
10571	Capital Meal.....	L. Lopez & Company, Biloxi.....
10960	Capital Meal.....	Gulfport Grocery Co., Gulfport..... Average..... Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10555	10.66	6.85	4.51 3.50	15.44 14.00	53.36 54.00	9.18 9.50
10556	9.82	9.81	10.11 8.87	11.31 11.44	49.91 53.55	9.04 9.37
10557	9.98	5.74	4.56 3.75	17.56 14.75	54.40 50.00	7.76 11.00
10558	10.95	5.17	5.28	19.25	55.06	4.29
10559	11.33	2.02	3.57	16.75	65.14	1.19
	11.14	3.59	4.43 4.00	18.00 16.50	60.10 52.00	2.74 6.00
10560	10.26	5.98	4.81	16.44	54.64	7.87
10561	9.80	5.45	4.94	16.94	55.89	6.98
10562	10.12	5.30	5.25	17.06	55.53	6.74
	10.06	5.58	5.00 5.00	16.81 16.75	55.35 53.60	7.20 8.75
10563	10.62	5.70	4.74 4.25	16.38 15.00	55.68 54.00	6.88 9.00
10564	11.08	5.84	4.64 3.50	15.81 11.50	55.63 52.00	7.00 9.00
10565	9.98	5.36	4.53 5.54	16.19 16.00	57.33 55.19	6.61 7.44
10566	11.42	6.43	4.35 3.80	15.75 16.12	58.31 62.87	3.74 3.53
10567	9.89	4.61	3.06	11.44	61.80	9.20
10568	10.87	4.78	2.80	11.13	61.41	9.01
10569	10.94	4.35	3.46	11.19	60.89	9.17
10570	10.39	4.24	2.98	11.31	64.75	6.33
	10.52	4.50	3.08 3.50	11.27 10.00	62.21 54.00	8.42 12.00
10571	11.37	1.23	2.81	7.06	70.29	7.24
10960	10.32	1.19	2.30	6.81	68.12	11.26
	10.85	1.21	2.55 4.00	6.94 9.50	69.20 62.00	9.25 8.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	CHARLESTON MILLING CO. Charleston, Mo.	
10572	Bran	Meyer Bros., Meridian.....
10573	Bran	The Fair Company, Louisville.....
		Average
		Guarantee
10575	Shipstuff	Meyer Bros., Meridian.....
		Guarantee
	H. C. COLE MILLING COMPANY, Chester, Ill.	
10576	Bran	Smith Bros., Vicksburg.....
10577	Bran	Smith Bros., Vicksburg.....
		Average
		Guarantee
	COLUMBIA STAR MILLING CO., Columbia, Ill.	
10578	Wheat Bran	E. W. Trautman, Long Beach.....
		Guarantee
10579	Middlings	Biloxi Milling Co., Biloxi.....
10580	Middlings	Hood Milling Co., Gulfport.....
		Average
		Guarantee
	CORNO MILLS COMPANY, St. Louis, Mo.	
10581	Creamo Dairy Feed	Barrett Grocerv Co., Lexington.....
		Guarantee
10582	Corno Hen Feed	Postlethwaite & Chase Co., Natchez...
10583	Corno Hen Feed	Greenwood Grocery Co., Greenwood...
		Average
		Guarantee
10584	Corno Horse & Mule Feed	Hannah Distributing Co. Jackson.....
10585	Corno Horse & Mule Feed	S. Bernheimer & Sons, Port Gibson...
10586	Corno Horse & Mule Feed	Postlethwaite & Chase Co., Natchez...
10587	Corno Horse & Mule Feed	Johnson-Woodward Co., Mt. Olive.....
10588	Corno Horse & Mule Feed	E. M. Odom, Star.....
10589	Corno Horse & Mule Feed	McLeod & Co., Purvis
10590	Corno Horse & Mule Feed	Barrett Grocerv Co., Lexington.....
10591	Corno Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
10592	Corno Horse & Mule Feed	Crawford Grocerv Co., Greenville.....
10593	Corno Horse & Mule Feed	Greenwood Grocery Co., Greenwood...
10594	Corno Horse & Mule Feed	A. W. Sturdivant, Winona
10595	Corno Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
10596	Corno Horse & Mule Feed	A. J. Lyons & Co., Meridian.....
10597	Corno Horse & Mule Feed	J. L. Walker & Co., Columbus.....
10598	Corno Horse & Mule Feed	New Albany Groc Co., New Albany.....
		Average
		Guarantee

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10572	9.88	6.26	4.31	13.81	60.62	5.12
10573	8.52	6.69	4.47	14.94	56.69	8.69
	9.20	6.48	4.39	14.38	58.65	6.90
			4.75	13.10	51.50	9.20
10575	9.95	3.70	6.04	14.81	61.25	4.25
			5.20	14.35	60.20	4.50
10576	8.92	6.99	4.64	14.56	55.44	9.45
10577	7.90	7.11	4.66	14.94	55.57	9.82
	8.41	7.06	4.65	14.75	55.50	9.63
			3.50	14.50	50.00	10.00
10578	9.70	7.08	5.09	15.50	54.01	8.62
			3.74	15.26	53.38	9.21
10579	10.34	4.18	4.51	15.75	60.97	4.25
10580	10.04	3.53	4.23	15.25	63.03	3.92
	10.19	3.86	4.37	15.50	62.00	4.08
			5.02	15.26	60.47	3.75
10581	7.56	5.31	4.82	14.44	46.47	21.40
			5.00	14.50	45.00	19.50
10582	12.18	1.40	2.70	10.88	70.74	2.10
10583	12.21	2.10	2.81	10.50	70.01	2.37
	12.20	1.75	2.76	10.69	70.37	2.23
			3.70	10.00	70.00	2.30
10584	10.75	3.29	4.19	9.81	59.69	12.27
10585	9.81	4.06	4.37	11.25	57.83	12.68
10586	9.41	3.93	3.71	11.19	57.43	14.33
10587	9.53	4.08	4.11	11.50	56.60	14.18
10588	9.08	4.20	4.04	10.75	57.88	14.05
10589	8.68	3.74	3.82	11.63	60.32	11.81
10590	9.18	3.73	3.61	11.00	57.36	15.12
10591	8.22	3.80	3.93	11.75	59.91	12.39
10592	9.12	4.15	3.89	11.63	57.48	13.73
10593	8.74	4.05	3.98	11.75	57.38	14.10
10594	7.62	4.38	4.08	11.31	57.45	15.16
10595	9.80	3.57	3.72	9.56	59.44	13.91
10596	8.83	3.91	3.94	9.19	60.14	13.99
10597	6.51	3.75	3.79	9.50	62.51	13.94
10598	7.91	3.36	4.03	8.38	61.28	15.04
	8.88	3.87	3.94	10.68	58.85	13.78
			3.50	10.00	58.50	12.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	DAHNIKE-WALKER MILLING CO., Union City, Tenn.	
10599	Wheat Bran	Clark Grocery Co., Tupelo.....
10600	Wheat Bran	F. Gardina, Greenville.....
		Average
		Guarantee.....
10601	Wheat Shorts.....	Clark Grocery Co., Tupelo.....
10602	Wheat Shorts.....	Davis & Chandler, West Point.....
		Average
		Guarantee.....
	DAVIS & ANDREWS COMPANY, Memphis, Tenn.	
10603	Wheat Bran	Delta Cotton & Grocery Co., Clarksdale
10604	Wheat Bran	Hill Bros. & Co., Aberdeen.....
		Average
		Guarantee.....
10605	Wheat Shorts.....	Gibson Grocery Co., Ackerman.....
		Guarantee.....
	DUNLAP MILLING COMPANY, Clarksville, Tenn.	
10606	Wheat Bran	Columbia Grocery Co., Columbia.....
10607	Wheat Bran	Foote-Drummond Co., Columbia.....
		Average
		Guarantee.....
10608	Wheat Middlings	Columbia Grocery Co., Columbia.....
		Guarantee.....
	J. B. EDGAR GRAIN COMPANY, Memphis, Tenn.	
10609	Ceralfa Stock Feed	Craig Bros., New Albany.....
10610	Ceralfa Stock Feed	The Planters Supply Co., Greenwood.....
10611	Ceralfa Stock Feed	Crawford Grocery Co., Greenville.....
10612	Ceralfa Stock Feed	Magruder & Co., Hattiesburg.....
		Average
		Guarantee.....
	EGGERS MILLING COMPANY, Hermann, Mo.	
10613	Bran	Brookhaven Wholesale Grocery Co., Brookhaven
		Guarantee.....
	M. FORCHHEIMER & COMPANY, Mobile, Ala.	
10614	Wheat Shorts.....	McInnis Bros., Moss Point.....
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10599	7.86	5.53	4.53	14.56	58.75	8.77
10600	8.26	6.81	4.93	15.13	56.31	8.56
	8.06	6.17	4.73	14.85	57.53	8.66
			<i>3.95</i>	<i>14.00</i>	<i>55.00</i>	<i>10.50</i>
10601	10.01	3.30	4.49	15.25	62.67	4.28
10602	9.71	3.08	4.44	14.56	63.86	4.35
	9.86	3.19	4.47	14.90	63.27	4.31
			<i>4.85</i>	<i>13.75</i>	<i>62.00</i>	<i>7.50</i>
10603	10.26	6.67	4.03	17.81	52.31	8.92
10604	8.00	6.08	4.43	17.25	57.23	7.01
	9.13	6.38	4.23	17.53	54.77	7.96
			<i>3.50</i>	<i>10.00</i>	<i>54.00</i>	<i>10.50</i>
10605	10.10	5.43	4.32	16.13	58.28	5.74
			<i>3.50</i>	<i>10.00</i>	<i>54.00</i>	<i>10.50</i>
10606	8.83	6.23	4.36	15.19	58.24	7.15
10607	8.12	6.26	4.20	15.00	57.02	9.40
	8.48	6.24	4.28	15.10	57.63	8.27
			<i>4.00</i>	<i>14.00</i>	<i>55.00</i>	<i>10.00</i>
10608	4.34	4.64	5.55	16.81	62.96	5.70
			<i>4.00</i>	<i>15.00</i>	<i>60.00</i>	<i>6.00</i>
10609	9.94	7.25	3.69	12.44	56.10	10.58
10610	8.62	7.78	5.15	13.19	54.75	10.51
10611	8.68	8.06	4.18	12.44	56.37	10.27
10612	11.86	6.42	3.44	13.00	55.11	10.17
	9.77	7.37	4.12	12.77	55.59	10.38
			<i>4.00</i>	<i>13.00</i>	<i>55.00</i>	<i>11.50</i>
10613	9.53	6.65	4.95	16.06	54.27	8.54
			<i>4.50</i>	<i>15.00</i>	<i>54.00</i>	<i>9.25</i>
10614	11.45	5.24	5.70	18.69	52.42	6.50
			<i>4.00</i>	<i>15.00</i>	<i>50.00</i>	<i>6.50</i>

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	A. H. GEORGE & COMPANY, Meridian, Miss.	
10618	George's Prepared Horse & Mule Feed	B. R. Fail, Bay Springs.....
10619	George's Prepared Horse & Mule Feed	A. H. George & Co., Meridian.....
10620	George's Prepared Horse & Mule Feed	A. H. George & Co., Meridian..... Average..... Guarantee.....
10621	Middling Shorts	Winner Klein & Co., Meridian..... Guarantee.....
	J. T. GIBBONS, New Orleans, La.	
10622	Wheat Bran	J. E. McNair, Lumberton.....
10623	Wheat Bran	Guy Northrop, Pass Christian..... Average..... Guarantee.....
	B. F. GLOVER & SON COM. CO., New Orleans, La.	
10624	Wheat Bran	Jas. O'Connell, Purvis.....
10625	Wheat Bran	W. M. Conner, Hattiesburg..... Average..... Guarantee.....
10626	Wheat Shorts.....	Hattiesburg Grocery Co., Hattiesburg..... Guarantee.....
10627	Rice Polish	Ginn & McDonald Co., Tylertown..... Guarantee.....
	GOOD LUCK MILLS, St. Louis, Mo.	
10628	Good Luck Alfalfa Feed	W. H. Pritchard & Co., Natchez..... Guarantee.....
	GREAT WESTERN CEREAL CO., Chicago, Ill.	
10629	Boss Chop Feed.....	Smith Bros., Vicksburg.....
10630	Boss Chop Feed.....	Taylor Wills Grocery Co., Jackson....
10631	Boss Chop Feed.....	H. L. Taylor, Bentonla.....
10632	Boss Chop Feed.....	Taylor Wills Grocery Co., Jackson....
10633	Boss Chop Feed.....	B. Kullman & Co., Natchez.....
10923	Boss Chop Feed.....	Southern Commission Co., Greenville...
10924	Boss Chop Feed.....	Southern Commission Co., Greenville... Average..... Guarantee.....
10634	Durham Chop Feed.....	I. Lowenberg & Co., Natchez
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10618	9.86	6.29	4.33	11.31	64.25	3.96
10619	8.79	6.22	5.39	9.38	59.72	10.50
10620	7.53	6.49	7.49	10.75	55.76	11.98
	8.73	6.33	5.71	10.48	59.91	8.81
			<i>4.00</i>	<i>12.00</i>	<i>60.00</i>	<i>4.62</i>
10621	8.06	3.54	5.48	8.44	62.68	11.80
			<i>3.50</i>	<i>10.00</i>	<i>50.00</i>	<i>6.50</i>
10622	10.25	6.54	4.38	17.44	53.31	8.08
10623	9.22	5.85	4.44	14.94	57.04	8.51
	9.74	6.20	4.41	16.19	55.17	8.29
			<i>3.75</i>	<i>13.00</i>	<i>55.50</i>	<i>10.00</i>
10624	9.66	6.26	4.42	14.56	55.63	9.47
10625	10.15	7.23	3.68	14.63	54.98	9.33
	9.90	6.74	4.05	14.60	55.31	9.40
			<i>3.58</i>	<i>14.85</i>	<i>54.60</i>	<i>10.00</i>
10626	11.05	3.59	5.08	17.88	56.58	5.82
			<i>4.50</i>	<i>14.90</i>	<i>56.80</i>	<i>7.40</i>
10627	7.51	3.52	9.85	12.06	65.85	1.21
			<i>10.17</i>	<i>10.53</i>	<i>62.40</i>	<i>1.20</i>
10628	12.16	4.64	3.04	12.75	56.41	11.00
			<i>3.80</i>	<i>12.00</i>	<i>58.00</i>	<i>8.90</i>
10629	9.10	5.18	4.29	8.88	63.62	8.93
10630	10.21	4.66	4.56	8.25	65.80	6.52
10631	8.78	5.08	4.55	8.69	63.32	9.58
10632	7.98	3.78	4.57	8.44	65.61	9.62
10633	9.68	6.13	4.73	8.00	62.34	9.12
10923	10.04	4.01	4.00	8.81	65.22	7.92
10924	9.12	2.92	5.34	9.56	65.56	7.50
	9.27	4.54	4.58	8.66	64.50	8.45
			<i>4.00</i>	<i>9.50</i>	<i>62.00</i>	<i>10.00</i>
10634	10.71	2.82	4.17	8.00	64.58	9.72
			<i>4.00</i>	<i>9.50</i>	<i>62.00</i>	<i>10.00</i>

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10635	Excelsior Chop Feed.....	A. G. Russell Co., Vicksburg.....
10636	Excelsior Chop Feed.....	C. J. Edwards Co., Vicksburg.....
10637	Excelsior Chop Feed.....	Phillips, Reinhart, Taylor Co., Booneville.....
10638	Excelsior Chop Feed.....	A. H. George & Co., Meridian.....
10639	Excelsior Chop Feed.....	P. P. Williams Co., Vicksburg.....
10640	Excelsior Chop Feed.....	C. J. Edwards Co., Vicksburg.....
		Average.....
		Guarantee.....
10641	Grainfalfa	Taylor Wills Grocery Co., Jackson.....
		Guarantee.....
10642	Maizefalfa	R. H. Green & Bro., Jackson.....
		Guarantee.....
	GULFPORT GROCERY COMPANY, Gulfport, Miss.	
10933	Mile Post Feed	W. W. Pigford, Lumberton.....
10934	Mile Post Feed	Bond Merc. Co., Bond.....
10935	Mile Post Feed	F. W. Lott, Wiggins.....
12416	Mile Post Feed	J. K. Henley, Biloxi.....
12417	Mile Post Feed	Gulfport Grocery Co., Gulfport.....
12418	Mile Post Feed	Barnes & Co., Columbia.....
12419	Mile Post Feed	W. C. Ellis Co., Magee.....
12420	Mile Post Feed	J. S. Eaton & Bro., Taylorsville.....
		Average.....
		Guarantee.....
	H. L. HALLIDAY MILLING CO., Cairo, Ill.	
10647	Wheat Bran	Gulfport Grocery Co., Gulfport.....
10648	Wheat Bran	J. K. Henley, Biloxi.....
10649	Wheat Bran	A. J. Lewis, Edwards.....
10650	Wheat Bran	Merchants Grocery Co., Hazlehurst.....
10651	Wheat Bran	Columbia Grocery Co., Columbia.....
		Average.....
		Guarantee.....
	HANNAH DISTRIBUTING CO., Jackson, Miss.	
10653	Mixed Feed	Hannah Distributing Co., Jackson.....
10654	Mixed Feed	Hannah Distributing Co., Jackson.....
		Average.....
		Guarantee.....
10655	Rice Polish	Hannah Distributing Co., Jackson.....
		Guarantee.....
	HANOVER STAR MILLING CO., Germantown, Ill.	
10656	Bran	E. P. Donald & Son, Philadelphia.....
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10635	10.06	6.34	4.87	9.13	62.20	7.40
10636	11.01	2.70	4.59	9.63	63.79	8.28
10637	10.68	2.80	5.20	8.63	64.67	8.02
10638	11.14	3.17	4.40	8.13	64.64	8.52
10639	8.39	4.97	4.88	8.56	65.53	7.67
10640	8.80	6.29	5.25	9.19	60.84	9.63
	10.01	4.38	4.87	8.88	63.61	8.25
			4.00	9.50	62.00	10.00
10641	10.58	4.88	3.02	10.94	61.27	9.31
	*					
10642	9.48	6.45	3.43	10.31	58.66	11.67
			4.00	12.00	58.00	11.00
10933	9.50	4.03	3.00	11.31	60.80	11.36
10934	9.61	4.01	3.21	11.25	60.84	11.08
10935	9.16	4.01	4.17	10.69	61.26	10.71
12416	9.07	4.13	3.51	11.13	61.48	10.68
12417	9.86	4.11	3.19	11.38	62.46	9.00
12418	9.75	4.80	3.29	10.88	60.81	10.47
12419	12.19	3.77	2.56	10.50	61.85	9.13
12420	10.85	3.92	2.65	10.31	62.99	9.28
	10.00	4.10	3.20	10.93	61.56	10.21
			3.50	10.00	57.50	12.00
10647	8.33	6.17	4.78	14.75	57.95	8.02
10648	9.91	6.35	4.87	15.31	55.04	8.52
10649	8.70	6.02	4.74	14.94	57.49	8.11
10650	9.08	5.78	4.93	15.25	57.39	7.57
10651	8.46	5.71	5.02	15.44	57.49	7.88
	8.90	6.00	4.87	15.14	57.07	8.02
			4.00	14.00	55.00	8.50
10653	8.26	4.95	3.75	15.88	60.61	6.55
10654	8.81	5.92	4.13	15.25	57.74	8.15
	8.53	5.43	3.94	15.57	59.18	7.35
			3.50	10.00	50.00	12.00
10655	8.81	4.64	8.17	10.56	66.77	1.05
			5.50	11.20	52.00	4.00
10656	10.02	6.02	4.55	15.31	55.66	8.44
			4.50	14.35	50.54	8.92

*No guarantee submitted.

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
HARDY GRAIN COMPANY, Union City, Tenn.		
10657	Mixed Feed Bran	Seward & Co., Ackerman.....
10658	Mixed Feed Bran	H. A. Hearon, Ackerman.....
10659	Mixed Feed Bran	Gibson Grocery Co., Ackerman.....
10660	Mixed Feed Bran	R. H. Green & Bro., Jackson.....
10904	Mixed Feed Bran	Buckley-Terry Co., Laurel.....
10910	Mixed Feed Bran	McInnis & Sturgis, Meridian.....
10911	Mixed Feed Bran	Meyer Bros., Meridian.....
10912	Mixed Feed Bran	Tom Lyle Grocery Co., Meridian.....
10913	Mixed Feed Bran	Queen City Feed & Produce Co., Meridian
10914	Mixed Feed Bran	A. J. Lyons & Co., Meridian.....
10915	Mixed Feed Bran	Winner Klein & Co., Meridian.....
10916	Mixed Feed Bran	Queen City F. & P. Co., Meridian.....
10953	Mixed Feed Bran	R. H. Green & Bro., Jackson.....
10954	Mixed Feed Bran	Taylor Wills Grocery Co., Jackson.....
11262	Mixed Feed Bran	Merchants Grocery Co., Hattiesburg.....
11263	Mixed Feed Bran	Threefoot Bros. & Co., Meridian.....
11294	Mixed Feed Bran	Merchants Grocery Co., Hattiesburg.....
11295	Mixed Feed Bran	Bay Grain Company, Bay St. Louis.....
11578	Mixed Feed Bran	T. J. Locke & Son, Columbus.....
		Average
		Guarantee.....
10661	Mixed Shorts	Queen City Feed Co., Meridian.....
10662	Mixed Shorts	Gulley, Overstreet & Co., Louisville.....
10663	Mixed Shorts	C. L. Nutts & Co., Philadelphia.....
10664	Mixed Shorts	A. J. Lyons & Co., Meridian.....
		Average
		Guarantee.....
HARTFIELD & COOK, Memphis, Tenn.		
10673	Wheat Bran	T. S. Cunningham, Aberdeen.....
		Guarantee.....
HUNTER BROS. MILLING CO., St. Louis, Mo.		
10674	Wheat Bran	Taylor-Wills Grocery Co., Jackson.....
10675	Wheat Bran	The Goyer Company, Greenville.....
10676	Wheat Bran	Capital Grocery Co., Jackson.....
		Average
		Guarantee.....
ILLINOIS FEED MILLS, St. Louis, Mo.		
10677	Feed Well Hen Feed	Southern Com. Co., Greenville.....
		Guarantee.....
10678	Peck's Mule Feed	Smith Merc. Co., Indianola.....
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10657	9.95	3.63	2.69	8.94	56.43	18.36
10658	10.42	4.00	2.92	9.63	60.08	12.95
10659	10.28	3.94	3.24	10.31	54.81	17.42
10660	9.97	3.91	2.78	9.56	56.50	17.28
10904	8.76	3.94	2.56	8.88	55.79	20.07
10910	7.94	3.16	4.28	7.56	53.40	23.66
10911	10.32	3.81	3.16	10.75	59.79	12.17
10912	9.60	3.86	3.04	9.94	56.10	17.46
10913	9.62	3.53	3.14	10.69	57.00	16.02
10914	10.15	4.14	3.09	10.75	54.84	17.03
10915	6.93	3.00	2.17	9.13	57.12	21.65
10916	8.10	3.24	2.42	7.56	55.30	23.38
10953	7.80	3.81	3.49	7.75	56.27	20.88
10954	8.61	4.25	2.86	9.63	56.00	18.65
11262	7.21	2.97	2.24	7.13	56.94	23.51
11263	8.60	4.24	3.25	10.38	55.41	18.12
11294	7.87	3.43	2.35	7.38	56.91	22.06
11295	7.08	3.60	2.52	8.56	57.11	21.13
11578	6.99	4.47	3.15	9.38	55.99	20.02
	8.75	3.72	2.92	9.16	56.41	19.04
			<i>4.00</i>	<i>12.01</i>	<i>54.02</i>	<i>6.61</i>
10661	9.57	3.40	4.58	12.00	58.44	12.01
10662	10.74	3.57	4.31	14.00	55.87	11.51
10663	10.09	3.15	4.94	13.00	56.43	12.39
10664	9.20	2.68	4.65	11.38	59.53	12.56
	9.90	3.20	4.61	12.60	59.57	12.12
			<i>4.03</i>	<i>12.99</i>	<i>60.71</i>	<i>7.89</i>
10673	11.04	6.67	4.20	15.56	53.30	9.23
			<i>3.57</i>	<i>14.80</i>	<i>54.60</i>	<i>10.00</i>
10674	10.10	6.01	5.19	14.88	54.26	9.56
10675	10.34	6.42	5.07	15.13	53.30	9.74
10676	10.40	7.19	5.05	16.19	51.17	10.00
	10.28	6.54	5.10	15.40	52.91	9.77
			<i>3.50</i>	<i>14.00</i>	<i>54.00</i>	<i>10.00</i>
10677	8.66	7.80	3.95	9.81	65.48	4.30
			<i>3.50</i>	<i>10.00</i>	<i>60.00</i>	<i>6.00</i>
10678	7.83	4.80	5.12	12.13	55.70	14.42
			<i>3.80</i>	<i>10.00</i>	<i>59.20</i>	<i>11.90</i>

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10679	Star Feed	Delta Grocery & Cotton Co., Clarksdale
10680	Star Feed	D. W. Wilkinson & Bro., Jackson.....
10681	Star Feed	Delta Cotton & Grocery Co., Clarksdale
		Average
		Guarantee.....
	KEMPER MILL & ELEVATOR CO. Kansas City, Mo.	
10682	Wheat Bran	Foote-Patrick Co., Laurel.....
		Guarantee.....
10683	Anchor Bran	McInnis & Sturgis, Meridian.....
10684	Anchor Bran	R. W. Fagan & Co., Waynesboro.....
		Average
		Guarantee.....
10685	Diamond Bran.....	Craig Bros., New Albany.....
		Guarantee.....
10686	Shorts	Foote-Patrick Co., Laurel.....
		Guarantee.....
	KOENINGSMARK MILL CO., Waterloo, Ill.	
10690	Wheat Middlings	J. J. Rogers & Son, Tupelo.....
10691	Wheat Middlings	J. J. Rogers & Son, Tupelo.....
		Average
		Guarantee.....
	KORNFALFA FEED MILLING CO., Kansas City, Mo.	
10692	Kornfalfa Feed	Gulfport Grocery Company, Gulfport
10936	Kornfalfa Feed	Gulfport Grocery Company, Gulfport
		Average
		Guarantee.....
	CHAS. A. KRAUSE MILLING CO., Milwaukee, Wis.	
10693	Badger Dairy Feed	R. H. Green & Bro., Jackson.....
		Guarantee.....
10694	Badger Stock Feed	R. H. Green & Bro., Jackson
		Guarantee.....
	LAWRENCE & HAMILTON FEED COMPANY, New Orleans, La.	
10695	Stafolife	Merchants Grocery Co., Hattiesburg...
10696	Stafolife	J. K. Henley, Biloxi.....
10697	Stafolife	Walton Bros. & Co., Newton.....
10698	Stafolife	E. F. Elkins, Meridian.....
10699	Stafolife	C. J. Edwards Co., Vicksburg.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10679	10.34	3.02	4.17	11.38	60.87	10.22
10680	9.45	3.38	4.57	12.81	57.54	12.25
10681	10.67	3.61	3.89	12.19	58.72	10.92
	10.06	3.49	4.23	12.50	58.13	11.59
			3.80	12.00	58.00	8.90
10682	8.80	6.39	5.20	15.50	54.22	9.89
			4.00	14.50	53.50	9.50
10683	7.70	8.04	4.98	14.69	53.71	10.88
10684	8.51	7.38	5.12	15.81	53.30	9.88
	8.10	17.71	5.05	15.25	53.51	10.38
			4.00	14.50	53.50	9.50
10685	9.10	6.38	5.53	17.69	52.33	8.97
			4.00	14.50	53.50	9.50
10686	7.50	3.89	6.20	18.56	58.00	5.85
			5.25	15.50	61.25	6.25
10690	7.56	3.57	4.65	15.88	63.96	4.38
10691	7.67	3.59	5.10	16.13	62.76	4.75
	7.61	3.58	4.88	16.01	63.36	4.56
			4.00	16.00	56.00	7.00
10692	12.57	3.82	2.98	10.13	59.58	10.92
10936	9.62	4.34	3.15	10.56	61.80	10.53
	11.09	4.08	3.07	10.35	60.69	10.72
			4.00	12.00	58.00	11.00
10693	14.96	7.15	3.88	18.13	45.57	10.31
			3.50	16.00	50.00	12.00
10694	13.40	5.41	4.84	13.88	49.64	12.83
			4.00	10.00	50.00	14.00
10695	8.86	8.10	4.00	14.69	48.50	15.85
10696	9.04	5.75	6.55	8.94	60.95	8.77
10697	8.55	7.92	7.19	10.00	55.39	10.95
10698	7.55	7.09	7.44	9.75	57.52	10.65
10699	8.63	5.96	7.73	11.44	56.86	9.38

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10700	Stafolife	E. F. Elkins, Meridian.....
10701	Stafolife	Tidwell & McCormick, Hickory.....
10702	Stafolife	McMullan & Sons, Hickory.....
10703	Stafolife	Harris & Company, Meridian.....
10704	Stafolife	R. W. Hinton Co., Lumberton.....
10705	Stafolife	A. Beer & Co., Natchez.....
10706	Stafolife	Lotterhos & Huber Co., Crystal Springs.....
11593	Stafolife	Merchants Grocery Co., Crystal Spr'gs.....
		Average.....
		Guarantee.....
	LIBERTY MILLS, Nashville, Tenn.	
10707	Wheat Bran	Denman-Alford Co., McComb.....
10708	Wheat Bran	W. L. Watkins & Co., Aterdeen.....
10709	Wheat Bran	Harris & Company, Meridian.....
10710	Wheat Bran	W. E. Laird, Hattiesburg.....
		Average.....
		Guarantee.....
10711	Wheat Shorts.....	J. L. Walker & Co., Columbus.....
10712	Wheat Shorts.....	Boyd & Russell, Philadelphia.....
10713	Wheat Shorts.....	Winner-Klein Co., Meridian.....
10714	Wheat Shorts.....	Harris & Company Meridian.....
		Average.....
		Guarantee.....
	LEAVENWORTH MILLING CO., Leavenworth, Kans.	
10715	Wheat Bran	The Mississippi Co., Canton.....
		Guarantee.....
10716	Wheat Middlings	Henderson-Molphus Co., Philadelphia.....
		Guarantee.....
	GEO. B. MATTHEWS & SONS, New Orleans, La.	
10717	Rice Polish	Parsons, May, Oberschmidt & Co., Brookhaven
10718	Rice Polish	Lampton Merc. Co., Magnolia.....
10719	Rice Polish	Wm. Atkinson & McDonald Co., Wess'n.....
10720	Rice Polish	Lampton Merc. Co., Magnolia.....
10721	Rice Polish	W. F. Funchess & Co., Osyka.....
10722	Rice Polish	Fernwood Lumber Co., Fernwood.....
10723	Rice Polish	J. K. Dunn, McComb.....
10724	Rice Polish	Lampton Merc. Co., Magnolia.....
		Average.....
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10700	6.97	6.26	6.77	10.00	61.65	8.35
10701	7.84	9.00	8.81	12.38	52.89	9.08
10702	7.12	8.94	7.80	12.00	53.06	11.08
10703	8.10	7.33	7.85	10.00	55.90	10.82
10704	8.33	7.51	7.65	9.81	56.44	10.26
10705	8.53	9.77	6.86	10.38	56.07	8.39
10706	8.90	6.03	7.77	10.50	57.65	9.15
11593	7.08	9.95	8.80	10.81	51.88	11.48
	8.12	7.66	7.33	10.82	55.75	10.32
			6.00	11.00	53.00	12.00
10707	9.90	6.58	4.50	15.25	55.26	8.51
10708	9.03	6.45	4.22	14.94	57.49	7.87
10709	8.25	7.11	4.61	15.13	55.51	9.39
10710	8.38	7.00	4.23	14.88	56.24	9.27
	8.89	6.78	4.39	15.05	55.13	8.76
			4.00	14.50	50.00	9.50
10711	10.47	4.00	4.61	15.88	60.02	5.02
10712	10.25	4.33	4.15	16.44	59.68	5.15
10713	8.24	4.25	4.68	16.06	61.73	5.04
10714	9.37	4.45	4.56	16.69	59.49	5.44
	9.58	4.26	4.50	16.26	60.23	5.17
			4.00	16.00	48.00	6.00
10715	9.49	7.23	4.57	16.06	53.35	9.30
	*					
10716	10.43	4.41	4.62	16.50	57.39	6.65
	*					
10717	9.52	5.29	10.87	11.75	61.08	1.49
10718	13.69	5.55	6.18	12.69	60.80	1.09
10719	11.88	4.90	5.62	9.94	66.34	1.32
10720	10.36	7.21	11.15	13.50	56.39	1.39
10721	10.97	6.28	8.70	13.00	59.66	1.39
10722	15.09	5.47	2.45	10.56	64.38	2.05
10723	11.27	5.35	8.93	11.38	61.02	2.05
10724	15.63	5.86	4.25	13.38	58.77	2.11
	12.30	5.74	7.27	12.02	61.06	1.61
			5.00	10.00	50.00	12.00

* No guarantee submitted.

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	MEEK MILLING COMPANY, Marissa, Ill.	
10729	Wheat Bran and Ground Wheat Screenings	G. Lowenberg & Co., Kosciusko..... Guarantee.....
10730	Wheat Shorts.....	Barnes & Co., Columbia..... Guarantee.....
	JOHN F. MEYER & SONS MILLING CO., Springfield, Mo.	
10731	Albatross Bran	Hattiesburg Grocery Co., Hattiesburg Guarantee.....
10732	Albatross Middlings	Hattiesburg Grocery Co., Hattiesburg Guarantee.....
	MILLSTADT MILLING COMPANY, Millstadt, Ill.	
10733	Wheat Bran	Threefoot Bros. & Co., Meridian.....
10734	Wheat Bran	Henderson-Molphus Co., Philadelphia Average
		Guarantee.....
10735	Wheat Middlings	Threefoot Bros. & Co., Meridian..... Guarantee.....
	NEW ATHENS MILLING CO., New Athens, Ill.	
10736	Bran & Wheat Screenings	Kennedy & Co., Wiggins..... Guarantee.....
10737	Wheat Middlings	D. C. Griffith & Co., Silver Creek.....
10738	Wheat Middlings	J. B. & R. A. Pool, Union.....
10739	Wheat Middlings	Kennedy & Co., Wiggins..... Average
		Guarantee.....
	NEW IBERIA RICE MILL CO., New Iberia, La.	
10740	Rice Polish	C Atkinson's Sons Co., Summit..... Guarantee.....
	NUTRILINE MILLING COMPANY, Crowley, La.	
10741	Nutriline	A. G. Russell Co., Vicksburg.....
10742	Nutriline	Threefoot Bros. & Co., Meridian.....
10743	Nutriline	Buckley-Terry Grocery Co., Laurel.....
10744	Nutriline	Queen City Feed Co., Meridian.....
10745	Nutriline	J. T. Searcy, Columbus.....
10905	Nutriline	Merchants Grocery Co., Crystal Sp'gs Average
		Guarantee

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10729	8.37	5.86	5.23 3.50	14.81 13.50	57.71 50.00	8.02 12.00
10730	10.15	3.46	4.81 3.50	14.56 13.50	62.84 54.00	4.18 8.50
10731	8.42	5.95	4.93 3.65	15.50 14.75	56.74 52.00	8.46 10.50
10732	10.82	2.61	4.45 4.00	16.94 14.00	62.71 63.00	2.47 3.50
10733	7.70	7.31	5.31	13.38	57.07	9.23
10734	7.92	7.01	5.36	14.50	56.12	9.09
	7.81	7.16	5.33	13.94	56.60	9.16
			3.50	11.27	59.54	6.04
10735	9.30	4.43	5.39 3.50	16.25 12.35	59.00 72.80	5.63 1.23
10736	9.39	6.37	5.45 3.50	14.81 14.00	55.79 55.00	8.19 9.50
10737	8.01	2.39	3.93	15.31	67.70	2.66
10738	9.73	1.94	3.85	15.25	67.05	2.18
10739	11.13	2.14	3.53	14.94	65.83	2.43
	9.62	2.15	3.77	15.17	66.86	2.43
			3.50	13.50	55.00	8.00
10740	9.95	5.81	9.43 9.22	11.69 10.19	62.12 62.97	1.00 1.25
10741	9.96	5.58	7.83	10.88	59.22	6.53
10742	12.27	5.50	6.98	11.19	55.99	8.07
10743	9.63	6.19	8.11	11.19	57.44	7.44
10744	11.81	6.52	7.08	12.94	53.73	7.93
10745	17.90	6.55	3.61	13.88	51.01	7.05
10905	12.00	7.01	6.61	13.81	52.88	7.69
	12.25	6.23	6.71	12.31	55.04	7.46
			3.50	12.00	58.00	10.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
GEO. P. PLANT MILLING CO., St. Louis, Mo.		
10746	Wheat Bran	W. H. Pritchard & Co., Natchez.....
10747	Wheat Bran	Geisenberger & Friedler, Natchez.....
10748	Wheat Bran	Geisenberger & Friedler, Natchez.....
10749	Wheat Bran	I. Lowenberg & Co., Natchez.....
10750	Wheat Bran	W. A. McDonald, Bay St. Louis.....
10751	Wheat Bran	A. Beer & Co., Natchez.....
10752	Wheat Bran	A. Beer & Co., Natchez.....
10753	Wheat Bran	Rumble & Wensel Co., Natchez.....
10754	Wheat Bran	Geisenberger & Friedler, Natchez.....
		Average
		Guarantee
THE QUAKER OATS COMPANY, Chicago, Ill.		
10755	Banner Feed	A. J. Lewis, Edwards.....
10756	Banner Feed	Merchants Grocery Co., Hattiesburg.....
10757	Banner Feed	D. G. Patton & Co., Jackson.....
10758	Banner Feed	Geisenberger & Friedler, Natchez.....
10759	Banner Feed	R. Veiner & Co., Natchez.....
10760	Banner Feed	R. Veiner & Co., Natchez.....
10761	Banner Feed	Geisenberger & Friedler, Natchez.....
10762	Banner Feed	Geisenberger & Friedler, Natchez.....
10763	Banner Feed	Geisenberger & Friedler, Natchez.....
10764	Banner Feed	R. Veiner & Co., Natchez.....
10765	Banner Feed	P. P. Williams Co., Vicksburg.....
10766	Banner Feed	Merchants Grocery Co., Brookhaven.....
10767	Banner Feed	Geisenberger & Friedler, Natchez.....
10768	Banner Feed	R. Veiner & Co., Natchez.....
		Average
		Guarantee
10771	Schumacher Scratching Grains	Hanes & Hood, Vicksburg.....
		Guarantee
RALSTON PURINA COMPANY, St. Louis, Mo.		
10772	Protena Feed (Alfalfa Mixt.)	Chas. Halsmith, Bolton.....
10773	Protena Feed (Alfalfa Mixt.)	Capital Grocery Co., Jackson.....
10774	Protena Feed (Alfalfa Mixt.)	Rumble & Wensel Co., Natchez.....
		Average
		Guarantee
10775	Purina Feed	W. O. Warrell & Co., Vicksburg.....
10776	Purina Feed	Capital Grocery Co., Jackson.....
10777	Purina Feed	W. O. Warrell & Co., Vicksburg.....
10778	Purina Feed	Rumble & Wensel Co., Natchez.....
10779	Purina Feed	The Goyer Co., Greenville.....
10780	Purina Feed	Hattiesburg Grocery Co., Hattiesburg.....
10781	Purina Feed	Sol Fried Co., Vicksburg.....
		Average
		Guarantee

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10746	8.53	6.05	4.73	16.13	55.63	8.93
10747	7.07	5.99	5.00	16.38	56.62	8.94
10748	8.90	6.18	4.42	16.06	55.78	8.66
10749	8.08	5.91	4.88	16.31	56.19	8.63
10750	7.21	6.03	4.90	16.63	56.33	8.90
10751	8.32	5.91	4.44	16.69	56.41	8.23
10752	7.13	6.16	4.30	17.38	56.28	8.75
10753	8.95	6.69	3.16	16.25	55.60	9.35
10754	8.20	6.13	4.24	17.38	55.72	8.33
	8.04	6.12	4.45	16.58	56.06	8.75
			4.00	16.00	54.00	9.00
10755	6.78	3.18	2.55	8.06	69.13	10.30
10756	6.55	3.23	2.82	9.06	69.97	8.37
10757	6.33	3.04	3.12	9.69	69.87	7.95
10758	6.65	3.23	3.65	9.50	67.74	9.23
10759	8.70	3.20	2.81	8.31	67.48	9.50
10760	7.83	3.39	2.36	8.50	68.57	9.35
10761	9.95	3.08	1.99	8.63	67.37	8.98
10762	7.18	3.53	3.29	8.94	68.16	8.90
10763	8.60	3.53	2.60	9.19	67.43	8.65
10764	8.27	3.26	2.92	9.13	68.16	8.26
10765	7.45	3.43	3.07	9.44	68.17	8.44
10766	7.36	3.43	3.01	9.19	68.08	8.93
10767	9.18	3.03	2.24	9.25	68.97	7.33
10768	8.05	3.12	2.78	8.38	68.97	8.70
	7.78	3.26	2.80	8.95	68.43	8.78
			3.75	9.75	63.00	10.50
10771	9.55	1.52	2.74	10.94	73.22	2.03
			3.50	10.50	64.00	4.50
10772	7.60	4.51	3.27	13.06	65.57	5.99
10773	5.68	4.52	4.19	12.13	59.68	13.80
10774	3.82	3.94	3.97	12.81	64.86	10.60
	5.70	4.32	3.81	12.67	63.37	10.13
			3.80	12.00	53.00	8.90
10775	6.24	4.10	4.09	12.19	62.41	10.97
10776	6.43	3.79	4.11	12.06	64.49	9.12
10777	6.82	4.64	2.15	12.13	66.16	8.10
10778	6.78	4.18	3.26	12.63	63.08	10.07
10779	5.56	4.15	3.71	12.63	64.93	9.02
10780	6.03	4.82	3.12	13.06	64.47	8.50
10781	4.65	4.21	3.88	13.31	65.19	8.76
	6.07	4.27	3.48	12.57	64.39	9.22
			4.00	12.50	58.00	8.90

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
10782	Purina Mill Feed (Chick and Scratch Size)	Gulfport Grocery Co., Gulfport..... Guarantee.....
	REA-PATTERSON MILLING CO., Coffeyville, Kansas.	
10783	Wheat Bran	The Lampton Co., Columbia.....
10784	Wheat Bran	Capital Grocery Co., Jackson..... Average
	REFUGE COTTON OIL COMPANY Columbus, Miss.	Guarantee.....
10785	Perfection Horse Feed	Refuge Cotton Oil Co., Columbus.....
12424	Perfection Horse Feed	Refuge Cotton Oil Co., Columbus..... Average
	ST. MARY'S MILLING COMPANY. St. Mary's, Mo.	Guarantee.....
10786	Wheat Bran	Lampton Merc. Co., Magnolia.....
10787	Wheat Bran	W. M. Biglane, Collins..... Average
		Guarantee.....
10788	Wheat Middlings	B. F. Youngblood & Co., Wesson.....
10789	Wheat Middlings	Seward & Co., Ackerman..... Average
	SAUERS MILLING COMPANY, Evansville, Ill.	Guarantee.....
10791	Shipstuff	T. M. Steele & Sons, Forest..... Guarantee.....
	N. SAUER MILLING COMPANY. Cherryvale, Kan.	
10792	Wheat Bran	C. J. Edwards Co., Vicksburg..... Guarantee.....
	SCOTT COUNTY MILLING CO., Sikeston, Mo.	
10793	Wheat Bran	Hinds, Hoyle Grocery Co., Tupelo.... Guarantee.....
10794	Wheat Middlings	Meyer Bros., Meridian.....
10795	Wheat Middlings	A. W. Allen, Tupelo..... Average
	STEELEVILLE MILLING CO., Steeleville, Ill.	Guarantee.....
10796	Brn	C. J. Edwards Co., Vicksburg..... Guarantee.....
10797	Middlings	C. J. Edwards Co., Vicksburg.....
10798	Middlings	D. C. Coney, Bogue Chitto..... Average
		Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10782	6.17	1.84	2.80 3.60	11.13 11.00	74.84 65.00	3.22 4.00
10783	8.07	4.26	4.24	16.69	58.92	7.82
10784	6.03	5.15	4.39	14.88	62.75	6.80
	7.05	4.70	4.32	15.78	60.84	7.31
			3.50	14.52	55.96	8.50
10785	6.93	3.13	2.09	15.38	64.06	8.41
12424	9.50	2.56	3.61	11.13	64.22	8.98
	8.21	2.85	2.85	13.26	64.14	8.69
			4.00	12.00	50.00	12.00
10786	5.03	6.42	5.70	16.13	59.61	7.11
10787	7.75	5.05	4.50	16.25	58.95	7.50
	6.39	5.73	5.10	16.19	59.28	7.31
			3.56	15.06	54.70	8.93
10788	6.43	3.10	5.37	16.75	66.15	2.20
10789	9.37	2.35	4.76	15.90	64.30	3.32
	7.90	2.72	5.06	16.33	65.23	2.76
			4.20	15.81	62.37	2.90
10791	8.88	3.22	4.30 4.20	16.69 14.96	62.90 60.10	4.01 4.92
10792	9.70	6.50	3.92 3.95	16.44 15.00	55.36 53.10	8.08 11.65
10793	7.61	6.19	4.15 4.00	15.81 14.15	58.99 55.00	7.25 9.00
10794	10.58	4.57	4.58	16.88	58.38	5.01
10795	7.52	3.73	5.55	17.50	62.25	3.45
	9.05	4.15	5.07	17.19	60.31	4.23
			5.93	16.27	61.60	4.50
10796	9.72	5.65	4.62 3.50	14.69 14.50	58.09 50.00	7.23 10.00
10797	9.25	3.73	3.41	14.81	64.15	4.65
10798	8.09	3.90	4.32	14.38	64.91	4.40
	8.67	3.81	3.87	14.59	64.53	4.53
			4.00	15.00	55.00	5.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	VALLEY MILLING COMPANY, St. Louis, Mo.	
10800	Delta Feed	I. Lowenberg & Co., Natchez..... Guarantee.....
	JOHN WADE & SONS, Memphis, Tenn.	
10801	Wheat Bran	A. W. Allen, Tupelo.....
10802	Wheat Bran	J. J. Heyer, Corinth.....
10803	Wheat Bran	Roane & Company, Grenada.....
10804	Wheat Bran	A. L. McCormick, Senatobia..... Average..... Guarantee.....
10805	Purity Feed	Miss. Italian Supply, Greenville.....
10806	Purity Feed	McMahon Grocery Co., Greenville.....
10807	Purity Feed	A. B. Voyles, Corinth.....
10894	Purity Feed	G. Lowenberg & Co., Kosciusko.....
10895	Purity Feed	McMahon Grocery Co., Greenville.....
10896	Purity Feed	J. C. Morgan, Collins.....
11550	Purity Feed	McMahon Grocery Co., Greenville..... Average..... Guarantee.....
10808	Wheat Shorts.....	J. J. Heyer, Corinth..... Guarantee.....
	WEBB & MAURY, Memphis, Tenn.	
10809	Wheat Shorts.....	Gulley, Overstreet Co., Louisville..... Guarantee.....
	YATES & DONELSON CO., Memphis, Tenn.	
10810	Wheat Bran mixed with Corn Bran	D. G. Patton & Co., Jackson.....
10811	Wheat Bran mixed with Corn Bran	Yazoo Grocery Co., Yazoo City.....
10812	Wheat Bran mixed with Corn Bran	Greenwood Grocery Co., Greenwood....
10813	Wheat Bran mixed with Corn Bran	McMahon Grocery Co., Greenville.....
10814	Wheat Bran mixed with Corn Bran	Yazoo Grocery Co., Yazoo City..... Average..... Guarantee.....

Collected by State Chemist, Season 1908-1909.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
10800	10.48	2.76	1.69 5.00	8.44 8.50	68.58 50.00	8.05 12.00
10801	8.49	5.46	4.04	16.81	58.22	6.98
10802	9.26	5.56	4.49	17.25	56.90	6.54
10803	8.19	7.22	4.36	17.13	54.80	8.30
10804	8.11	6.82	4.21	17.75	55.33	7.78
	8.51	6.26	4.28 3.50	17.24 10.00	56.31 50.00	7.40 12.00
10805	10.03	1.79	4.07	9.00	70.37	4.74
10806	15.60	1.88	1.03	8.81	65.86	6.82
10807	8.55	1.94	4.52	9.25	71.30	4.44
10894	11.03	3.71	4.16	8.31	66.98	5.81
10895	12.48	3.12	4.06	8.63	65.88	5.83
10896	11.68	3.55	4.00	8.19	66.43	6.15
11550	6.47	1.92	3.51	8.94	71.55	7.61
	10.83	2.56	3.62 4.25	8.74 9.25	68.34 65.00	5.91 5.50
10808	6.10	4.97	5.57 3.50	20.00 10.00	58.23 50.00	5.13 12.00
10809	7.50	4.00	4.58 3.50	18.75 10.00	61.79 50.00	3.38 12.00
10810	8.01	5.86	4.56	15.88	58.66	7.03
10811	8.03	5.48	4.71	15.31	56.55	9.92
10812	9.30	5.37	4.96	14.94	57.98	7.45
10813	8.52	5.91	4.33	15.81	58.67	6.76
10814	8.23	5.49	4.58	15.63	58.92	7.15
	8.42	5.62	4.63 3.70	15.52 13.25	58.15 57.15	7.66 10.00

Mississippi Agricultural Experiment Station.

BULLETIN 134.

JANUARY, 1910.

BROOM CORN.

By W. R. PERKINS.

The numerous inquiries being received by the Station in regard to the growing of broom corn has suggested the publication of the following press bulletin or circular of information on that subject.

Since the growing of this crop is quite different from growing the staple crops of this state, especially in its harvesting, curing and marketing, and as it requires a considerable amount of skill, with a special equipment of machinery and commodious sheds in which to dry and cure the straw, I would caution those who contemplate changing from cotton to broom corn to be careful lest they meet with disappointment and loss to begin with. Go slow at first and learn from experience a great many things that are necessary in order to put on the market a class of material that will sell at a profit.

Nature of plant.—Broom corn belongs to the sorghum species as do Kafir corn, Milo Maize, and common sorghum. It contains very little sugar and is what is known as a non-saccharine sorghum. It is not so good as ordinary sorghum for forage and is surpassed by Kafir corn in the production of seed. The length of the panicle or seed head constitutes its most striking difference to the above plants, and it is this seed head or brush, after the seed have been removed, that is used for making brooms, and that makes it a valuable crop.

Kinds of broom corn.—There are two distinct types of the plant cultivated and used for making brooms. One is the standard kind with head 18 to 30 inches long used for making large brooms, and the other is the dwarf broom corn with head 10 to 18 inches long used for making whisk brooms, hearth brooms, etc. The latter kind is more popular in a dry climate such as is found in some of the western states.

Varieties.—As is the case with most cultivated plants there are a great many varieties of each of the above types of broom corn. Of the standard type, Tennessee Evergreen, California Golden Evergreen, etc., will be found listed by seedmen. To one beginning the growing of the crop, one variety will be about as good as another,

the value of any seed depending on the care that has been taken in saving them.

Good seed.—There are two main considerations to the successful growing of this crop: One is that a good yield is obtained, which means that every stalk should produce a marketable brush, and the other is, that the brush should be of good quality; and both of the conditions are very dependent on the quality of seed. It is not only necessary that the stalk produce a full sized head, but that the texture of the straw be fine, that the heads be uniform in size and quality, and that they all come to maturity at the same time. During the past year the station grew two varieties of broom corn. There was no apparent difference in them and in both a large per cent of stalks failed to produce a brush of marketable quality, in addition to possessing all the faults to a marked extent that have been referred to. It is suggested that anyone going into this business should go in to stay and that two or three varieties be planted the first year in the hope of securing one, the seed of which has been carefully selected. In case one of superior quality is found, sufficient area of this planting should be saved for seed. Before the seed in the select patch have been formed, go through and cut out all inferior stalks or poorly shaped heads and save seed only from those that possess the desired qualities. This is the only way that seed of reliable quality can be had, and no one should be willing to plant any other kind. This careful selection of seed should be kept up every year as long as one grows broom corn.

Soil and season best suited to growth.—Broom corn being much like sorghum requires about the same conditions for its growth that is required by that plant. It will do well on almost any soil, but like most farm crops will vary in yield with the richness of the land, the fertilizer used, and the culture given.

In regard to season it is more exacting in that it is very essential to have nice, fair weather from the time the heads are well out until the crop is gathered and cured. Much wet weather at this time, not only makes it difficult to cure the crop into a high class product, but damp weather conditions favor the ravages of plant lice and fungus diseases in the heads, both of which are the cause of poor quality in the crop when ready for market.

Preparing the soil.—It is a wise plan to prepare land well for any crop, and broom corn is no exception to the rule. The soil should be worked into a fine seed bed in order to get the plants up and started

to growing promptly. If the land is rough and grassy the stand is liable to be bad and the early growth will be so slow as to allow grass to cause a great deal of additional expense in the hoeing required.

Planting.—Standard broom corn should be planted in rows 3 feet to $3\frac{1}{2}$ feet wide, and on good land, a stalk should stand every four inches in the row. As the land planted becomes poorer, the stalks should stand farther apart—each grower having to use his judgment as to the proper distance for any given piece of soil. It is probably better to have a few too many stalks on the land than too few, because of the tendency of the straw to become coarse if the individual stalks have enough space to permit their making a very rank growth. Suckers are also very likely to appear on the stalks where a thin stand occupies the land and they rarely produce marketable straw.

In our experiments last season planting was done May 11th, and I feel sure this date is too early for an average year. The weather at this season is frequently cool, which is detrimental to quick germination and to rapid growth of the young plants, and as a result, the crop may get grassy before it is large enough to cultivate. This will necessitate more work with the hoe than one should count on giving, and thus increase the expense of growing the crop. In addition to this, broom corn planted at the date above mentioned, will reach the harvesting stage at a time when we are liable to have considerable rain, and if possible, this should be avoided. One thing every broom corn grower should determine to do is to put a high class product on the market; and he will soon learn that this is impossible if much rain comes while the crop is being saved.

I would recommend planting in June, and on well prepared, moist soil it may very safely be planted in July. Broom corn growers prefer to plant just what seed that are expected to grow on the land, so as to avoid any thinning which is a tedious job, and one that is liable to do more or less injury to the small plants left. About 3 pounds of seed of such quality that 95 per cent of them will germinate are ample for a stand if the land is in condition and the planting properly done.

Planting is best done with a planter, the holes in the plates of which are of the proper size to drop the required number of seed. The seed should be covered from $\frac{1}{2}$ to 1 inch and the soil pressed down on them with a wheel or roller attached to the planter. The object being to get them up quick so that the side harrow or other implement can be put in the field before the grass gets a start.

Cultivation.—After the first cultivation with some fine toothed cultivator, any implement may be used that accomplishes the object sought in cultivating crops in general. These objects are to keep clear of grass; to prevent the soils crusting; or in other words, to maintain a mulch of loose soil and to avoid high ridges in the later cultivations, except where lack of drainage makes it necessary to leave in ridges. To facilitate the working, some growers prefer to plant in hill 15 to 18 inches apart, leaving 5 or 6 stalks in a hill. The dwarf kind should be left about 25 per cent thicker on the land than the standard kind.

Harvesting.—The heads are ready to cut when the bloom begins to dry up and to fall from the stalk, and before any seed are formed. In order that the brush be of best quality as well as of the desirable green color when cured, it is necessary to cut at this stage. The harvesting of the standard broom corn is rather tedious, and on account of its height, the practice of turning the stalks 4 or 5 feet from the top is very general. This process is called tabling the crop, and is done by turning two adjacent rows across the middle between them so that the stalks form a table with the heads extending into middles on either side. The stalks are turned diagonally across the middle, first a stalk from one row and then one from the other, making a self-supporting surface above with the head at a convenient height to be cut by the man with a knife who passes up the alternate middle and cuts the heads from two rows at a time 8 inches below head. The heads are piled on top of the table and are hauled at once to the curing shed where the machines for stripping off the seed is installed. The seed are removed as soon after cutting as possible, and the curing must be done under a well ventilated cover to preserve the green color and to avoid any mold or bleaching in the process of curing.

Removing the seed from heads.—When there is a considerable area to be handled, a power thresher or machine for stripping off the seed is necessary. This machine consists of a cylinder with teeth or spikes set in its surface. The brush is carried between the cylinders by means of a toothed belt that holds them firmly, and the rapidly revolving cylinder removes the seed. Such a machine with a capacity to clean 20 or more acres a day costs from \$150.00 to \$200.00. Further information about the machine can be had from manufacturers of agricultural machines.

Where a small area is to be cleaned, an ordinary curry comb removes the seed very satisfactorily though it is a slow and expensive

method. Another very satisfactory hand stripper can be made by inserting sharpened steel spikes an inch or two long into a solid setting and attaching this to a bench or box. The seed are removed by drawing over these spikes.

Curing.—After the seed are removed, which should be done as soon as possible after cutting, the cleaned straw must be stored in thin layers on racks under a shed until it has dried to the point where no moisture can be wrung out of the stalks. A free circulation of air must be maintained and at the same time light should be excluded as far as possible, sunlight having a tendency to bleach the straw. The layers of straw on the racks should not be more than 3 inches thick in order that it may dry out rapidly and not become moldy. When properly dried, which should not take more than three or four weeks, the brush should be removed from the rack and bulked under shed in straight piles for a few weeks in order that it may pass through a sweat and become so perfectly cured as to be out of danger of molding after it has been baled.

Baling.—Broom corn is marketed in bales 26 inches square by 45 inches long and weighing about 300 pounds each. A horse power press is used. The seed end of the brush is lapped in the middle with the butts extended to and forming the ends of the bales. The bales are bound with 5 No. 9 wire.

Sorting the brush.—The market demands a uniform grade of brush and it is necessary before the baling point is reached to go through and separate into different grades, placing in different lots the well colored straight straw; and the discoloured or damaged straw; and the crooked straw. The price received for the crop determines very largely the profits made in the business and it is very essential that this sorting be carefully done. The buyers are well acquainted with all of the devices resorted to by dishonest growers in adding unnecessary weight to the brush or in packing inferior stuff with the good. The trade demands an honest product and it pays to meet the requirements.

The price of broom corn varies from year to year, usually ranging from \$60.00 to \$125.00 per ton for the best grades. Crooked straw sells at about half the price paid for straight straw of the same quality.

A good yield is a ton to three acres.

✱ We have drawn considerable from Farmers Bulletin No. 174, U. S. Dept. of Agriculture, by C. P. Hartley, in preparing this circular and give due credit for the information.

Mississippi Agricultural Experiment Station.

BULLETIN NO. 135.

JANUARY, 1910.

COTTON 1909.

BY W. R. PERKINS.

The Weather.—In the two following tables is given a condensed summary of the weather during 1909. Table 1 shows the rainfall and the number of days in each month on which record is made of any rain having fallen. Table 2 gives the minimum temperature registered each month and the average minimum. The latter is obtained by adding together the lowest temperature recorded each day during the month and dividing by the number of days. The maximum temperature for each month is also given together with the average maximum temperature for the month obtained by the same method as the average minimum temperature.

Table I.—Rainfall, 1909.

Month.	Total Rainfall.	Number of days on which rain fell.
January	1.54 inches	7
February	6.47 inches	10
March.....	12.68 inches	12
April.....	6.49 inches	8
May	10.79 inches	12
June	7.71 inches	16
July	3.25 inches	10
August ..	1.87 inches	7
September	2.78 inches	6
October	.65 inches	1
November	1.40 inches	5
December	4.42 inches	9
Total	60.05 inches	

Table II.—Temperatures, 1909.

Month.	Minimum.	Average Minimum.	Maximum.	Average Maximum.
January	13°	37.8°	76°	55.9°
February	16°	38.3°	80°	59.6°
March.....	30°	45.1°	80°	66.0°
April.....	34°	52.0°	87°	75.8°
May	38°	54.8°	88°	77.0°
June	62°	68.3°	95°	89.5°
July	63°	68.5°	98°	92.0°
August	66°	71.8°	102°	94.0°
September	42°	62.9°	100°	86.5°
October	33°	48.5°	94°	79.0°
November	27°	46.6°	86°	75.9°
December	12°	29.5°	73°	51.3°

The rainfall during the year was 60.05 inches, which is above the average for this section. Seven months of the year were below the normal; leaving all of the deficit in rain for these months and excess for the year to be made up by rainfall of the remaining five months, from February to June, inclusive. The precipitation during these months was 44.14 inches.

This excessive rainfall coming at the time it did interfered greatly with the preparation of the land for crops, the planting and earlier working of the crop and was undoubtedly largely responsible for the short crop that was general all over this state.

While there was an abundant amount of rain in April, it was not well distributed and there was some trouble from lack of moisture just about cotton planting time that delayed the getting of a stand of the crop in many instances. May and June were excessively wet and heroic treatment in the way of plowing had to be resorted to in order to keep the grass from taking the fields.

On the whole the damage to our crop by lack of rain in the late summer was more apparent than from wet weather of the earlier part of the growing season. During the fall the weather was all that could have been asked in so far as the early opening and gathering of the crop were concerned.

Varieties of Cotton.—The results obtained from 23 varieties showing yield of seed cotton, lint, seed, total value and other data are given in the following table:

Table III.—Varieties of Cotton 1909.

	Pickings—Lbs. Seed Cotton per Plot.						Total Seed Cotton Lbs. per acre.	Per Cent Lint.	Lint, Lbs. per acre.	Seed, Lbs. per acre.	Value Lint per acre at 14c.	Value Seed per acre at \$25 Ton.	Total Value per acre.	Length of Staple in Inches.	No. of Bolls to weigh 1 lb.	Rank.
	Sept. 8th.	Sept. 27th.	Oct. 15th.	Nov. 2nd.	Dec. 1st.											
Cook's Improved	31	77	51	47	25		2310	38	877	1433	\$ 122.78	\$17.91	140.69	7-8	65	1
Cook's Improved No. 22	37	78	44	35	23		2170	40	868	1302	121.52	16.27	137.79	3/4	70	2
Cleveland Big Boll	23	66	55	35	38		2170	35.5	770	1400	107.80	17.50	125.30	1	54	3
Edgeworth	27	79	53	40	22		2210	34.5	762	1448	106.68	18.10	124.78	7-8	64	4
* Triumph	42	57	35.5	25.5	14		2024	38.0	768	1256	107.52	15.70	123.22	1	50	5
Sugar Loaf	50	66	37.5	18	12		1835	38.3	702	1132	98.28	14.15	112.43	3/4	97	6
Moss' Improved	10	46	47.5	50	36		1895	36.6	693	1202	97.02	15.02	112.04	7-8	78	7
Truitt's 90-day	38	68	48.5	25	20		1995	34.0	678	1317	94.92	16.46	111.38	1	87	8
Simpkins	50	72	43.5	20	14		1995	34.0	678	1317	94.92	16.46	111.38	7-8	91	9
Mortgage Lifter	14	67	53.5	45	24		2035	32.5	661	1374	92.54	17.27	109.81	1	60	10
Covington-Toole	10	47	51	47	28		1830	37	677	1153	94.78	14.41	109.19	1	80	11
Peterkin	9	41	47	50	40		1870	36	673	1197	94.22	14.96	109.18	1	77	12
Williams	10	34	44	46	36		1983	32.5	644	1339	90.16	16.74	106.90	7-8	62	13
Gold Coin	14	46	46	47	30		1830	35.8	655	1175	91.70	14.69	106.39	1	80	14
Triumph	10	48	38.5	50	29		1855	34.1	632	1223	88.48	15.29	103.77	1-8	50	15
Byrd	35	58	47	33	18		1910	32.0	611	1293	85.54	16.24	101.78	1	83	16
Bennett	15	42	46	32	25		1600	38.0	608	992	85.12	12.40	97.52	1-16	52	17
Cameron	10	45	48	40	28		1710	35.0	596	1114	83.44	13.92	97.36	7-8	82	18
Berryhill	19	60	44.5	31	20		1745	33.7	588	1157	82.32	14.46	96.78	3/4	79	19
Culpepper	7	44	53	45	28		1770	33	584	1186	81.76	14.80	96.56	1	62	20
Toole	8	35	41	47	33.5		1645	36	592	1053	82.88	13.16	96.04	1	87	21
Excelsior	14	40	47.5	40	26		1675	33.3	557	1118	77.98	13.97	91.35	3/4	78	22
Ran Williams	3	35	43	61	40		1820	29.2	531	1289	74.34	16.11	90.45	1	56	23
** Columbia	24	64	49	35	19		1913	29.5	564	1349	124.08	16.86	140.94	1-3-8	70	24

* Seed from A. D. Mebane.

** Lint valued at 22c.

During the past season as has always been our custom, an effort was made to eliminate as far as possible, any condition as to soil, planting, or method of cultivation that would influence the results. A plot of good loam valley soil was used for the work, the same plot used for this experiment in 1908. The plot was planted in one row plots repeating each seven times. The rows were $4\frac{1}{2}$ feet wide and the cotton was thinned to one stalk about every 18 inches. The planting was done May 4th and 5th.

Notes on varieties.—The size of bolls, length of staple, size of seed and such data as are generally of most interest will be found in the table.

Cook's Improved has very uniformly been among the most productive varieties that have been tested at this station. It is a very productive cotton but has a very short staple which is against it in a few markets of the state. It is also reputed to be very subject to the disease known as anthracnose or pink boll rot. We have not found it so on the station farm as is shown by our results in comparison with other varieties. I do not in any sense doubt that the disease has injured the crop seriously in other places. We have been careful to select seed as free from the disease as possible which is possibly a factor in our success with it. Another point that may have some bearing on this disease in cotton is that diseases in general are more liable to damage weak than strong healthy plants; hence this disease to my knowledge is worse in cotton that has been stunted or injured from having been "in the grass," poor drainage or poor cultivation. An examination of all of the varieties in the test was made by Dr. Hibbard, Station Bacteriologist, to ascertain the extent to which the different varieties were affected with this disease. The results follow:

Most diseased: Cook's Improved (home grown seed), Columbia, Triumph (seed from A. D. Mebane).

Next most diseased: Ran Williams, Byrd, Cleveland Big Boll, Peterkin, Cook's Improved (from J. R. Cook), Cameron, Triumph (from Excelsior Seed Farm).

Next most diseased (3rd class): Lewis' Prize, Covington-Toole, Simpkins, Bennett, Edgeworth, Moss' Improved.

Next most diseased (4th class): Toole, Culpepper, Berryhill, Williams, Excelsior, Truitt 90-Day.

Least diseased: Sugar Loaf, Cold Goin.

An estimate of the infected bolls in those varieties "most diseased," placed the number at 2 to 4%. As we go down the list the number decreased till there was only a fraction of a per cent in those "least diseased."

There are other varieties in this list just as good as the Cook variety in many respects—possibly better in some. Cleveland and Triumph deserve mention on account of their many good points and some of the smaller balled kinds like Sugar Loaf, and Simpkins will be popular on account of their earliness as well as on account of being good producers of cotton.

Another point that should be considered in studying this table is that every variety is planted from the very best seed obtainable, and that seed of this character can rarely be found on the market.

Table IV.—Varieties 1909.

NAME.	1st Picking—Sept. 20th.	2nd Picking—Oct. 12th.	3rd Picking—Nov. 5th.	4th Picking—Dec. 1st.	Seed Cotton per acre.	Per Cent Lint.	Lint per acre.	Seed per acre.	Value per acre, Lint at 14c.	Value per acre, Seed, \$25 per ton.	Total Value per acre.
Cook's Improved	83	56	25	14	1424	40%	569	855	\$ 79.66	\$10.69	\$90.35
Cleveland	88	60	24	8	1440	37%	532	908	74.48	11.35	85.83
Russell Big Boll.	74	53	32	10	1352	33 1-3%	450	902	63.00	11.27	74.27
Sugar Loaf	90	34	10	4	1104	37%	408	696	57.12	8.70	65.82
Truitt's 90-Day	85	40	11	5	1128	35%	394	734	55.16	9.27	64.43

The above test was made for two reasons: To test two of the earliest small balled kinds on a different soil from that used in the main test and to plant them a little later.

This patch was planted May 11th, on a piece of soil that graded from a good quality of loam up to rather poor yellow clay. Five varieties were used in single row plots repeated seven times. The area in each variety was approximately one-eighth of an acre, and the relative standing of the varieties is similar to that of the same varieties in the main test. Russell Big Boll was not planted in the

main patch on account of the seed not having been received till after the planting had been done.

Table V.—Width of Rows, 1909.

Plot.	Area.	Yield.	Yield per Acre Seed Cotton.
12 - 6 ft. rows	.72 A.	1389 lbs.	1930 lbs.
13 - 5 ft. rows	.67 A.	1373 lbs.	2049 lbs.
8 - 4 ft. rows	.35 A.	761 lbs.	2175 lbs.

It is the common belief that cotton on rich land should be planted in very wide rows. The results shown above indicate clearly that there might be considerable loss due to having the rows too wide; a greater loss even, than the figures above indicate for there was some difference in the soil—that on which the five and six foot rows were planted were better than the soil of the four foot rows. The cotton in this test grew to a height of about five feet, and it is our opinion that the yields would have been better had the rows not been over 4½ feet wide.

Table VI.—Topping Cotton, 1909.

	1st Picking	2nd Picking.	3rd Picking.	Total.
Topped	222	79	94	395 lbs.
Not topped	198	64	104	366 lbs.

The area in this experiment consisted of two rows extending the full length of the cut of land—about 500 yards long. One row on either side of these two rows was gathered as the check, or rows that were not topped.

The topping was done August 1st. The indications from this experiment are that the topping did some good both as to total yield and early maturity of the cotton. A one-year result, however, must not be taken as conclusive evidence that topping will pay every year or under any kind of field conditions.

Breeding Cotton.

In the fall of 1904 six selections of Cook's Improved cotton were made and the seed of each planted in separate rows in 1905. Cook's Improved was chosen because in our test for that year this variety had produced the largest yield of any cotton grown in the test and

the results at other stations the previous year had shown it to be a superior cotton in its capacity to yield large crops. An important point in beginning the improvement of any plant is to choose one that already possesses as many of the desirable qualities as can be found. During the following years from 1905 to 1909 one general plan has been followed in this work which is practically as follows: During each fall when the cotton was well opened each plat was carefully examined and the stalks that showed any marked superiority in quality were selected for the planting the following year. The well matured and perfect bolls from these stalks were picked and kept in small bags properly labelled. About 100 to 200 such stalks were selected each year.

The points that were taken into consideration in making the selections were:

Freedom from disease—especial notice was taken of the pink boll rot or anthracnose.

Size of bolls—large bolls being always chosen when the stalk was good in other respects.

Long fruit limbs with short joints coming out near the ground—such form of stalk has been found to be earlier than the long jointed varieties. Only four or five medium sized primary limbs were desired on the stalks.

A high per cent of lint.—This could not be accurately determined in the field though a very close estimate could be formed by the thickness of the mat of lint around the seed.

After gathering the selected stalks, 50 grams of cotton from each were accurately weighed and the lint removed by hand to determine the actual per cent of lint, and the size of seed. The final selections for planting the next year were made from the data obtained.

For a year or two the cotton was planted without previously removing the lint, but on account of the difficulty experienced in getting a stand by this method it was abandoned and the cotton was ginned on a small 10-saw gin. From one to two acres of land was devoted to this work each year, and the practice was to gather the select cotton from the whole patch after the stalks had been selected and to plant the general crop out of the seed. -

In 1908 after the single stalk selections had been saved, each plat was gathered and saved separately. The seed from these different plats—amounting to one or two bushels of each kind—were used in 1909 for planting separate cuts of land. These cuts became multiplying patches for the different strains of the pedigreed seed.

Multiplying Patches, 1909.

An area of practically 28 acres is included in these patches, ranging from less than an acre to as much as 4 acres in each. They were planted with the seed from the best and most promising blocks in the breeding patch of 1908. The land was good valley soil with the exception of three or four plats of hill land. The yield from the whole was 15,256 pounds of lint cotton or about 31 bales. The cotton from each cut was gathered and ginned separately and the seed disposed of to farmers in different sections of the state, each lot representing a pedigreed strain of Cook's Improved cotton. In addition to the above the station grew about 27 acres more of cotton of various varieties, making in all, about 55 acres, from which was gathered 55 bales of cotton.

Method of cultivation.—Since there have been numerous inquiries about the method followed in growing this crop, we have thought it advisable to add a few paragraphs on this part of the work. The land on which the cotton was grown is a good grade of valley land on the whole, though some hill land was cultivated. The whole area could be classed as good loam soil.

Drainage.—One of the main points to consider before planting a crop is the drainage. It is difficult to put a piece of undrained soil in such condition early in the spring that seed will come up promptly and the young plants grow off rapidly and in healthy condition. This particular feature is not so important when the spring and summer following are favorable to a long and continuous growth of the crop. The trouble is that the growing season will not be good during a sufficient proportion of the year to justify one's "trusting to luck" in such an important matter, and the advent of the boll weevil will make every year a bad one on poorly drained soils that produce only a late crop of cotton.

The soil of the station fields was poorly drained in places. During January, which was a very favorable month for work as seen from the rainfall recorded, wide, flat, open drains were constructed in the field at any place where the water could not get off of the land promptly after rains. These drains were laid off straight and followed the general direction of the low areas in the field. They were plowed out from 6 to 12 feet wide, depending on the amount of water to be carried, and the dirt removed with a drag scraper. After this they were plowed again and scraped. Generally two plowings were sufficient though

another was given if needed. Such ditches are cheap, not in the way of cultivating the crop, and can be kept perfectly clear of grass and weeds by plowing them when the crops are being cultivated.

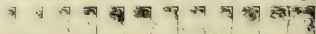
Preparation of soil.—About 20 acres of the 55 were badly infested with Johnson grass. This portion was plowed 4 to 5 inches deep during January. In March as the Johnson grass began to grow the disk harrow was run over it. Again early in April it was disked. Nothing further was done till just before planting time when it was disked again, the rows run off 4 feet wide with a middle breaker, and the cotton planted at once, the object being to keep the ground cultivated and to get the cotton up as soon as possible after the last disking, in order to get an even start with the grass. In this way the Johnson grass land was as easily cultivated as other portions of the field. Some of the land was plowed with a reversible disk plow and later bedded while the greater portion was bedded with a two-horse plow 5 inches deep and re-bedded, the list furrows in the rebedding having been turned from 2 to 4 weeks before planting time in order to insure a well compacted, firm seed bed. Where the ground was at all rough a small toothed cultivator like the "Gee Whiz" was run ahead of the planter.

Fertilizers.—Probably 15 acres of this area received a dressing of manure this season or during the past five years. The manure was distributed with a manure spreader on the broken ground and disked in before bedding the land. It was on this manured portion that the best cotton was grown, the yield in every instance being from $1\frac{1}{2}$ to 2 bales per acre where the manure was applied.

Planting.—The land being in good condition it was not necessary to plant the seed very thick nor do I consider it best to plant thick at any time. When a few seed are distributed along the row, the young plants come up stronger, grow off faster, and there is no danger of injuring them in the thinning process. In the presence of the boll weevil an early crop is very desirable and one of the important steps in getting this is a good seed bed, good strong seed, and thin planting covered shallow, generally in order to get the plants up early and started to growing. Not over $\frac{3}{4}$ of a bushel of seed per acre were planted anywhere and in most cases a half bushel was all that was used.

Cultivation.—Cultivation, like the preparation of the soil, varied on different cuts of land, and of necessity will always vary as conditions in the field become different.

As a general thing a Pope side harrow was run around the cotton soon after it was up, followed by the Perry cultivator after the first plowing though there was a small area barred off and still another area that became very grassy was run around with the cotton scraper. Both of these last mentioned areas were then gone around with a 16-inch sweep and the middles put out with a 12-inch middle "buster." These latter areas were very easily worked and it was done much better with the common, crude implements mentioned than would have been possible with any other implements on the farm. And so it will always be in cultivating a crop of cotton: one implement will do exactly what you want one time, while, under different conditions, it may be almost useless. A knowledge of what the different implements will do, and a good assortment of them is very essential to economic cotton growing. There can be no rules to follow, except to do what is required to make the greatest possible crop on a given piece of soil. It was not our aim to make the crop with the smallest number of furrows but rather to make the best crop possible with whatever number of furrows were required.

After the earlier cultivation we alternated with a small cultivator like the Perry that threw some dirt to the cotton and one that had a tendency to flatten down the beds—like the "Gee Whiz" and double cultivator with spring tooth side harrow attachments. No sweep or turn plows were used late in the season. 

Varieties of cotton grown.—The cotton grown in this crop, with the exception of the variety patch, were Cook's Improved, referred to above as pedigreed seed, and the Cleveland Big Boll, both areas being planted in the best seed that could be obtained.

The Cook's Improved made the largest yield, but had considerable advantage in its location in the field.

The Cleveland was planted on land just as good and the greater portion of which had been in alfalfa during the previous year and two years before. On this account we thought the Cleveland cotton was being favored, but the growth of the crop during the summer and the yield obtained showed that in this we were mistaken.

Where the alfalfa had grown the cotton never appeared to be in healthy condition and the leaves were shed very early in the fall. We have noticed this apparent injurious effect of alfalfa on cotton on certain soils for the past two years.

Fertilizer Experiments.—Results for Three Years.

In the spring of 1909 a series of twelve plots were put in a fertilizer test with the expectation of keeping the same division of plots with the same fertilizer each year for a long period. The year 1909 finished the third year with these plots and the results for each year are tabulated in the following table, No. 7:

Results with Fertilizers.**Table VII.—Fertilizer Tests—Three Years; One-eighth Acre Plats.**

Plot.	FERTILIZER PER PLOT.	Yield Seed Cotton 1907. lbs.	Yield Seed Cotton 1908. lbs.	Yield Seed Cotton 1909. lbs.
1	Kainit, 36 lbs.	183.5	242.5	218
2	Acid Phosphate, 36 lbs.	192.5	211	169
3	Cottonseed meal, 36 lbs.	158.5	172	104
4		160	173	155
5	Manure, $\frac{1}{2}$ ton, Lime, 100 lbs., '08.	191	304	218
6	Kainit, 36 lbs. Cottonseed meal, 36 lbs.	208	239	202
7	Kainit, 36 lbs. Acid phosphate, 36 lbs. Cottonseed meal, 36 lbs.	220	234	199
8	Manure, 2,000 lbs.	217	294	305
9	Manure, 1,000 lbs. Acid phosphate, 36 lbs.	202	254	224
10	Manure, 1,000 lbs., Kainit, 36 lbs.	180	262	210
11	Kainit, 36 lbs., Acid phosphate, 36 lbs.	162	210	203
12	Cottonseed meal, 36 lbs., Acid Phosphate, 36 lbs.	130	174	130

The soil in this piece of land is not perfectly uniform, and for that reason, it was very evident that to compare one plot with another would mean nothing. It was thought that results for a number of years from the same plot treated in the same manner could be compared with the relative yields obtained from plot 4—without ferti-

lizer—for the same years, and some conclusions reached as to the relative merits of different fertilizers' applications.

The soil is largely a light loam with yellow clay subsoil, though the plots extend through a narrow strip of soil a little heavier in type. Plot one is made up largely of a clay loam very suitable for alfalfa growing. The most striking results obtained are that barn-yard manure has given the largest increase in the yield, whether used alone or in combination with commercial fertilizers. The size of each plot is one-eighth of an acre.

Next to manure in increasing the yield stands kainit or the combinations in which kainit is used.

Acid phosphate and cottonseed meal agree very closely with the plot on which no fertilizer was used. Plot No. 3 fertilized with cottonseed meal, was a very poor stand in 1909, which probably accounts for the small crop obtained from this plot the past season.

It should be borne in mind that these experiments were made at the A. & M. College and will not answer for any section of the state except, perhaps, the northeast prairie region. The evident benefit from kainit was probably due to the fact that cotton is very subject to rust on this particular piece of land and the kainit prevented the rust. The same was noticeable on the plots where manure was used, while those receiving only the cottonseed meal, acid phosphate, or no fertilizer at all shed their leaves very early on account of rust, and consequently failed to put on as much crop.

It is hoped that these plots will be continued in the same fertilizers for a number of years longer.

Table VIII which follows gives the results obtained from 18 plots that were treated in the manner indicated to see if this different treatment would materially affect the earliness as well as the total yield of cotton from each.

Each plot was planted in duplicate to try the effect of a light application of nitrate of soda at time of planting. This idea had been suggested by certain experimenters and in theory appeared very promising, though our results fail to show any benefit from the application. The application of nitrate of soda is generally very dependent on suitable weather conditions soon after its application if good results are to follow, and the weather was not all that was desired after its use in these experiments. While an average rainfall was recorded in April, there was a dry spell towards the close of the month, and

Yield of Seed Cotton.

Table VIII.—Effect of Varied Treatment on Yield and Early Maturity of Cotton. One-tenth Acre Plots.

Plot.	TREATMENT.	1st Picking, Sept. 10th.					2nd Picking, Oct. 13th.					4th Picking, Nov. 9th.					5th Picking, Nov. 27th.					Total Yield One Plot.				
		lbs.					lbs.					lbs.					lbs.					lbs.				
1	Plowed 10 inches deep, April 10th	46	64	42	35	192	46	64	42	35	192	46	64	42	35	192	46	64	42	35	192	46	64	42	35	192
2	Plowed 10 inches deep April 10th; 25 lbs. nitrate of Soda per acre	55	89	41	42	232	55	89	41	42	232	55	89	41	42	232	55	89	41	42	232	55	89	41	42	232
3	Plowed one time, 4 inches deep	54	71	45	45	219	54	71	45	45	219	54	71	45	45	219	54	71	45	45	219	54	71	45	45	219
4	Plowed one time, 4 inches deep; 25 lbs. nitrate of soda per acre	54	78	50	40	226	54	78	50	40	226	54	78	50	40	226	54	78	50	40	226	54	78	50	40	226
5	Plowed twice, 4 inches deep	45	81	50	47	228	45	81	50	47	228	45	81	50	47	228	45	81	50	47	228	45	81	50	47	228
6	Plowed twice, 4 inches deep, 25 lbs. nitrate of soda per acre	49	83	45	37	222	49	83	45	37	222	49	83	45	37	222	49	83	45	37	222	49	83	45	37	222
7	Manure, 5 tons per acre, broadcast	42	86	60	55	248	42	86	60	55	248	42	86	60	55	248	42	86	60	55	248	42	86	60	55	248
8	Manure, 5 tons per acre, broadcast, and 25 lbs. nitrate of soda per acre	42	82	49	27	205	42	82	49	27	205	42	82	49	27	205	42	82	49	27	205	42	82	49	27	205
9	Manure, 5 tons per acre in drill	42	81	45	29	202	42	81	45	29	202	42	81	45	29	202	42	81	45	29	202	42	81	45	29	202
10	Manure 5 tons per acre in drills, and 25 lbs nitrate of soda per acre	48	76	50	37	216	48	76	50	37	216	48	76	50	37	216	48	76	50	37	216	48	76	50	37	216
11	Manure, 10 tons per acre, broadcast	42	74	52	52	229	42	74	52	52	229	42	74	52	52	229	42	74	52	52	229	42	74	52	52	229
12	Manure, 10 tons per acre broadcast, and 25 lbs. nitrate of soda per acre	40	82	53	55	228	40	82	53	55	228	40	82	53	55	228	40	82	53	55	228	40	82	53	55	228
13	Manure, 10 tons per acre in drills	37	74	57	28	216	37	74	57	28	216	37	74	57	28	216	37	74	57	28	216	37	74	57	28	216
14	Manure, 10 tons per acre in drills and 25 lbs. nitrate of soda per acre	37	71	47	45	224	37	71	47	45	224	37	71	47	45	224	37	71	47	45	224	37	71	47	45	224
15	500 lbs. C-S. meal per acre	45	69	41	35	200	45	69	41	35	200	45	69	41	35	200	45	69	41	35	200	45	69	41	35	200
16	500 lbs. C-S. meal per acre and 25 lbs. nitrate of soda per acre	37	63	40	35	186	37	63	40	35	186	37	63	40	35	186	37	63	40	35	186	37	63	40	35	186
17	500 lbs. acid phosphate per acre	37	54	47	40	188	37	54	47	40	188	37	54	47	40	188	37	54	47	40	188	37	54	47	40	188
18	500 lbs. acid phosphate per acre and 25 lbs. nitrate of soda per acre	28	65	52	43	208	28	65	52	43	208	28	65	52	43	208	28	65	52	43	208	28	65	52	43	208

for two weeks after this cotton was planted the ground was very dry. This period was followed by a spell of very wet and cool weather which must have removed all of the nitrate from the soil before the cotton could get the benefit of it. This application of 25 lbs. of nitrate per acre with the seed at planting should serve to bring the cotton up strong and start it with a vigorous growth, and with favorable weather, I can see no reason why it should not be a good start for an early crop.

The results as a whole fail to show any striking differences. Plot 1, being in a corner with a road as two boundaries, was run over by teams and probably damaged slightly.

Time Required for Cotton to Open after the Blooms Appear.

Test No. 1—Tagged July 15th—White Blossoms.

	Date of Open Bolls.	No. Days from Bloom.
1—Truitt's 90-Day	August 26th	40 days.
2—Sugar Loaf		
3—Triumph	Sept. 4th.	51 days.
4—Gold Coin		
5—Excelsior		
6—Moss Improved	September 1st.	48 days.
7—Williams	Sept. 1st, 2d, 3rd.	48-50 days.
8—Berryhill	Aug. 26th, 28th.	42-44 days.
9—Culpepper		
10—Edgeworth	August 28th to Sept.	44-49 days.
11—Bennett	Sept. 1st, 2nd.	48 days.
12—Mortgage Lifter	Sept. 3rd, 4th, 5th.	50-53 days.
13—Cameron	August 28th to Sept. 2	44-49 days.
14—Simpkins	August 28th.	44 days.
15—Covington Toole		
16—Cook's Improved	Aug. 28 to Sept. 1, 2, 3, 4	44-51 days.

Average for all bolls of all varieties, 46 days.

Test No. 2—Tagged August 2nd, 1909—White Blossoms.

	Date of Open Bolls.	No. days from Bloom to Open Boll.
1	Sept. 13, 14, 15, 16, 18	42-47 days.
2	Sept. 13, 15, 16	42-45 days.
3		
4		
5		
6	Sept. 17, 18	46-47 days.
7		
8	Sept. 14, 18	43-47 days.
9	Sept. 13, 14, 16	42-45 days.
10	Sept. 18	47 days.
11	Sept. 18	47 days.
12		
13	Sept. 14, 15	43-44 days.
14	Sept. 13, 16	42-45 days.
15	Sept. 13, 14, 15, 18	42-47 days.
16	Sept. 16	45 days.
17	Sept. 14, 15, 16, 17, 18	43-47 days.
18	Sept. 14, 16	43-45 days.
19	Sept. 19	50 days.

Average for all bolls of all varieties, 45 days.

Test No. 3—Tagged July 24th—White Blossoms.

	Date of Open Bolls.	No. of Days from Bloom to Open Bolls.
Russell Big Boll	Sept. 2, 5, to 16	40-54 days.
Cook	Sept. 4-9	42-47 days.
Cleveland.....	Sept. 6-9	44-47 days.
Sugar Loaf	Sept. 1-9	39-47 days.
Truitt's 90-day	Sept. 1-9	39-47 days.

Average for all bolls on all varieties, 44 $\frac{3}{4}$ days.

The figures in the above tables show the time required for cotton to open from the date of the first appearance of the white bloom. The

average time required for the cotton to open in the three tests was very nearly the same, the greatest amount of time being required in the test commencing at the earliest date—July 15th. The data in the second table was obtained from cotton adjoining that in test 1, on first class bottom soil. The latter blooms opened on an average one day quicker. In the third test the land was not so good and the cotton did not grow so large. The cotton in this case opened nearly two days earlier, though not so many varieties were represented.

There appears to be a tendency for the smaller balled varieties to open in a little less time than is required by the big balled kinds.

In the third test the most striking result was the variation in time required to open by different bolls on the same row. This is particularly to be noted in the Russell Big Boll cotton, which varied from Sept. 2nd to Sept. 15, in bolls, the blooms of which appeared on July 24th. It was noted in the field, however, that the time required to mature and open a boll varied with the character of soil and the exposure of cotton to sunlight. The small cotton on thin land opening from one to two weeks quicker than on rank cotton grown on rich soil.

Mississippi Agricultural Experiment Station.

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BULLETIN No. 136.  
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FEEDING BEEF STEERS ON COTTONSEED MEAL, ON PASTURE.

By J. A. McLEAN.

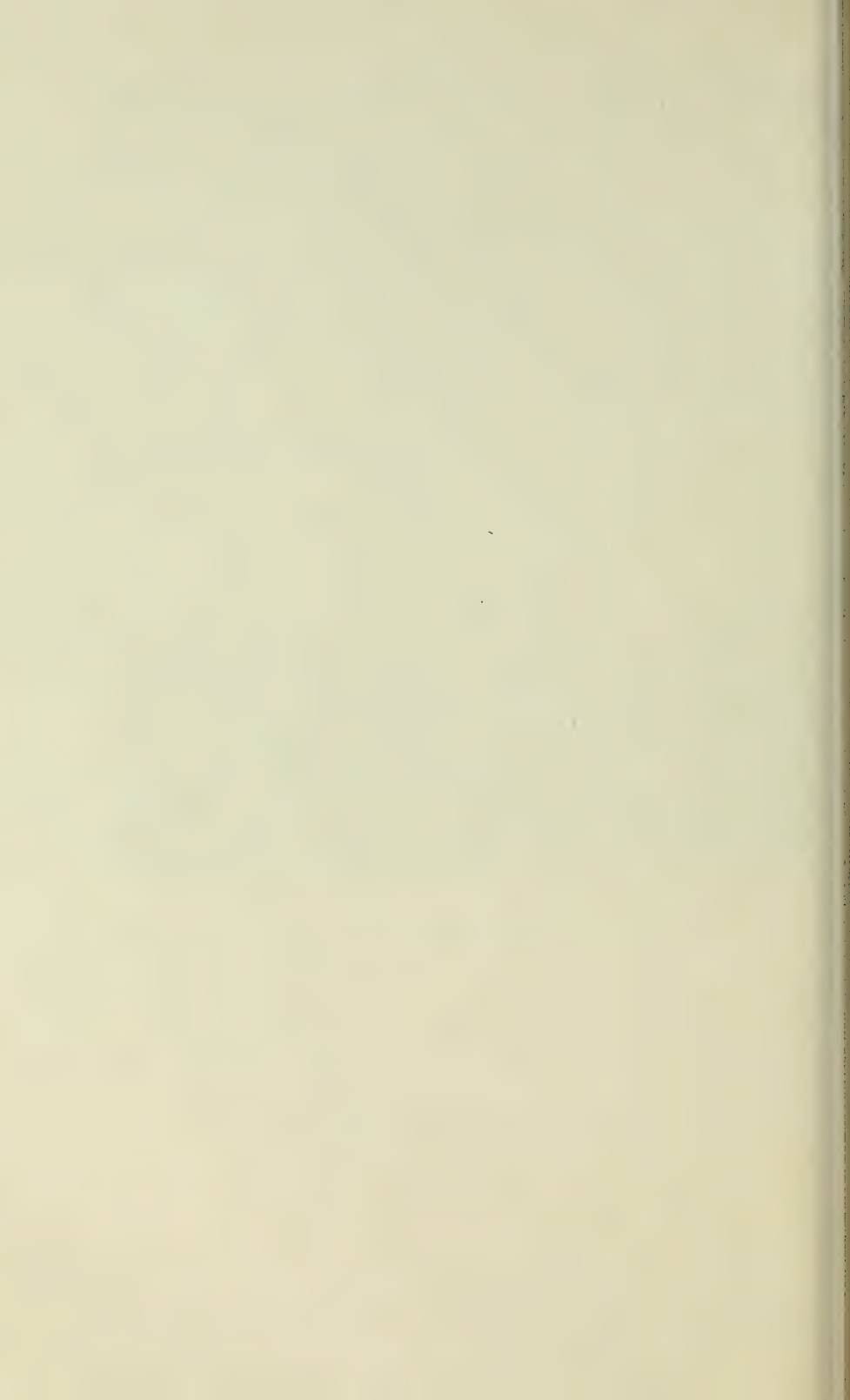


Fig. 3.—MISSISSIPPI RAISED STEERS. THE BEST STEERS IN THE
EXPERIMENT.

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AGRICULTURAL COLLEGE, MISSISSIPPI

MARCH, 1910.





# FEEDING BEEF STEERS.

## (1) ON COTTONSEED MEAL, ON PASTURE.

### Introduction.

During the winter of 1908-09 two car loads of steers were fed at this Station on cottonseed meal and hulls. The results of that work are obtainable in Mississippi Experiment Station bulletin 121. While excellent results were obtained from the standpoint of daily gain and cost of gain in those tests, yet it is evident from that work that the hulls which formed the roughage increased the cost and reduced the profits. In truth the hulls cost almost as much as the meal as may be seen by reference to the above mentioned bulletin. This excessive outlay for roughage indicated that there must be some more economical method of supplying this roughage to fattening cattle. Accordingly during the summer of 1909 a bunch of 20 steers were fattened upon pasture. A statement of this feeding trial is reported in this bulletin.

**Purpose.**—This experiment was undertaken to obtain information regarding the making of beef in Mississippi upon summer pasture when cotton-seed meal forms the concentrates consumed; and to determine the relative merits of grass and of hulls both being fed in conjunction with cottonseed meal.

**Plan.**—The value of cotton-seed meal when fed in conjunction with hulls has been demonstrated in bulletin 121. To gain information concerning the value of cotton-seed meal when fed in conjunction with grass and to give a basis of comparison with the results of bulletin 121, 20 steers were purchased at Elton, Mississippi, at \$30.00 each and brought by railroad to the Experiment Station. They were loaded on the car at Jackson, Mississippi, after having been driven six miles on the evening of July 12, and arrived at Starkville July 13, at 9 A. M. They were immediately unloaded and placed in a good bermuda pasture with free access to water. They were weighed during the afternoons of July 13, July 14, and July 15. They were then turned into a wooded pasture and retained there for one month without any supplemental feed. They were weighed again on three successive days, viz., August 12, August 13, and August 14, each time being 12 hours off pasture and water. The average of these three days weighings was taken as the initial weight of the steers and on August

14 they were started upon feed in the pasture. They were fed until November 19 and weighed for three successive days at 8 A. M. in the morning, having been 14 hours off feed and water each day. The average of these three weighings is taken as the final weights of the steers.

### The Pasture.

The accompanying photographs No. 1 and No. 2, are presented to give some idea of the pasture used in this experiment. It is far from a good pasture and is in no way superior to the average grazing land.



FIG. 1.—ONE VIEW OF PASTURE.



FIG. 2.—ANOTHER VIEW OF PASTURE.

of central and northern Mississippi. Much of it is wooded and part of it so densely that no grass grows upon it. It is quite rolling with lime outcroppings. Lespedeza forms the chief grazing with melilotus, a little white clover, and bermuda grass scattered over it. During the latter part of the experimental period, the grass, on account of a dry fall, did not furnish sufficient grazing, which necessitated the shipping of the cattle before they were finished for market.



FIG. 4.—THE LEAST DESIRABLE STEERS IN THE LOT.



FIG. 5.—THE MEDIUM STEERS OF THE LOT.

#### The Steers.

These steers were rather a mixed lot. They lacked in uniformity of type and breeding. All were bred by the man from whom they were purchased and their appearance fully justified the statement that each carried one or more crosses of beef blood. Some evidenced Angus breeding, some Hereford, and some Shorthorn, while 6 displayed



outwardly more pronouncedly their close relation to the dairy breeds. Yet aside from their color markings the steers were a fairly uniform lot as is evidenced by their selling without any cut-outs in the market. The accompanying photographs were taken the day before shipping to St. Louis and show the type and character of the steers.

### Feeding.

These steers were started on a ration of 2 pounds of meal per head per day and gradually the amount per day was increased until in ten days (or by August 24) they were consuming 4 pounds per head per day. This amount was not varied until the 22nd of October when the daily ration was increased to  $4\frac{1}{2}$  pounds per head and again October 25 to 5 pounds per head per day, which ration was maintained until the end of the period.

In order to facilitate the feeding of the cotton-seed meal it was mixed each day with an equal weight of hulls, thus, when the cattle were obtaining 100 pounds of meal per day they were also getting 100 pounds of hulls. By this method the cattle were prevented from too greedily eating the meal, or wasting it; it also prevented any one animal from obtaining more than its share. This amount of hulls apparently corrected any tendency to excessive laxativeness that might be expected from such a ration fed upon grass for at no time did any of the animals scour.

The animals were fed twice each day, at 7 A. M. and at 5 P. M., respectively.

At no time was any of the animals seriously sick although steer X 5 was noticed to be indifferent to feed frequently and at four different feeding times during the feeding period he refused to eat at all. The rest of them seemed to eat very well throughout the entire period.

Table 1.—Weights and Gains.

| No.                         | COLOR. | Initial Wt.<br>August 14. | Final Wt.<br>November 18. | Gain in<br>Pounds. | Number of<br>Days. | Daily Gain<br>in Pounds. |
|-----------------------------|--------|---------------------------|---------------------------|--------------------|--------------------|--------------------------|
| 181—Black.....              |        | 963                       | 1150                      | 187                | 97                 | 1.93                     |
| X 1—Yellow Red .....        |        | 972                       | 1103                      | 131                | 97                 | 1.35                     |
| 182—Yellow Red .....        |        | 964                       | 1120                      | 156                | 97                 | 1.61                     |
| 160—Red White Face .....    |        | 952                       | 1101                      | 149                | 97                 | 1.54                     |
| X 2—Yellow Red .....        |        | 917                       | 1026                      | 109                | 97                 | 1.12                     |
| 153—Red, White Face .....   |        | 936                       | 1064                      | 128                | 97                 | 1.32                     |
| 122—Red .....               |        | 1020                      | 1167                      | 147                | 97                 | 1.51                     |
| 136—Yellow, Red .....       |        | 1053                      | 1186                      | 133                | 97                 | 1.37                     |
| 185—Yellow, Red .....       |        | 1041                      | 1165                      | 124                | 97                 | 1.28                     |
| X 3—Red .....               |        | 1131                      | 1313                      | 182                | 97                 | 1.87                     |
| 128—Red, White Face .....   |        | 1054                      | 1146                      | 92                 | 97                 | .95                      |
| 115—Black.....              |        | 1090                      | 1249                      | 159                | 97                 | 1.64                     |
| X 0—Black, White Face ..... |        | 1102                      | 1232                      | 130                | 97                 | 1.34                     |
| X 4—Yellow, Red .....       |        | 855                       | 944                       | 89                 | 97                 | .92                      |
| X 5—Red, White Face .....   |        | 1134                      | 1157                      | 23                 | 97                 | .24                      |
| 126—Red .....               |        | 959                       | 1060                      | 101                | 97                 | 1.04                     |
| X 6—Red .....               |        | 965                       | 1077                      | 112                | 97                 | 1.15                     |
| 133—Spotted .....           |        | 878                       | 943                       | 65                 | 97                 | .65                      |
| X 7—Red, White Face .....   |        | 954                       | 1091                      | 137                | 97                 | 1.41                     |
| 203—Yellow, Red .....       |        | 985                       | 1084                      | 99                 | 97                 | 1.02                     |
| Total .....                 |        | 19925                     | 22378                     | 2453               |                    |                          |
| Average .....               |        | 996                       | 1118                      | 1226               | 97                 | 1.26                     |

NOTE 1.—The color is attached in this table as indicating the breed and type features to an extent.

NOTE 2.—The initial weight is the average of 3 days' separate weighing, the stock being 12 hours off feed and water.

NOTE 3.—The final weight is the average of 3 successive days' weighing in each case the stock being 14 hours off feed and water.

The preceding table shows that the average daily gain per head was not high, being 1.26 pounds. Three steers gained less than 1

pound per day, one of which was steer X 5 which gained but .24 pounds per day. This steer was one of the best in the entire group when purchased. He showed no symptoms of sickness previous to the experiment but apparently the ration did not agree with him since at several intervals during the period he refused to eat the meal and for two or three days at a time appeared sluggish. Only five of the steers gained more than 1.5 pounds per day and none gained as much as 2 pounds per day for the entire period. The average gain per head per day for the entire period is indeed much smaller than was expected, or might reasonably be expected, from steers of the age and weight of those used. Undoubtedly the shortness of the pasture during the last 5 to 6 weeks had much to do in producing the light gains.

**Table II.—Feed, Cost of Feed, etc.**

|                                      |          | MEAL.     | HULLS.    |
|--------------------------------------|----------|-----------|-----------|
| Total fed .....                      |          | 8002 lbs. | 8042 lbs. |
| Cost per ton .....                   |          | \$28.00   | \$5.00    |
| Total cost .....                     |          | \$112.03  | \$20.10   |
| Cost of all feed .....               | \$132.13 |           |           |
| Feed consumed per day .....          |          | 82.5      | 82.9      |
| Feed consumed per head per day ..... |          | 4.12      | 4.14      |
| Feed required per pound gain .....   |          | 3.26      | 3.28      |

**Table III.**

|                           |          |
|---------------------------|----------|
| Total cost of feed .....  | \$132.13 |
| Total gain .....          | 2453     |
| Cost per pound gain ..... | 5.38c    |

### Marketing.

These steers were shipped to the National Stock Yards, St. Louis, Illinois, and sold by Clay Robinson and Company to Armour and Company. They were shipped from Starkville Friday afternoon, November 19, leaving at 4 P. M., and reached St. Louis Monday morning at about 6 A. M., November 22, thus being 62 hours on the road. Ordinarily 36 hours is the time occupied in transit. The result was most disastrous to the steers, causing an inordinate shrinkage and putting them in the market in disadvantageous appearance. They weighed before shipping, as is shown in a previous table, on an average, 1118 pounds while their average selling weight was 1026 pounds,

thus there was a shrink of 93 pounds per head which is more than a half above what the shrink in such a shipment should be.

The steers sold in a solid group, with no cuts, on a very full market that was quoted 10c to 15c off, and brought \$4.80 per cwt.

### Financial Statement.

#### EXPENDITURES.

|                                          |          |          |
|------------------------------------------|----------|----------|
| 20 head steers at \$30.00 each.....      | \$600.00 |          |
| Feed .....                               | 132.13   |          |
| Freight from Jackson to Starkville ..... | 25.00    |          |
| Freight to St. Louis.....                | 71.00    |          |
| Yardage .....                            | 5.00     |          |
| Hay.....                                 | 1.70     |          |
| Commission .....                         | 10.00    |          |
| <hr/>                                    |          |          |
| Total .....                              | \$844.83 | \$844.83 |

#### RECEIPTS.

|                                                              |    |        |
|--------------------------------------------------------------|----|--------|
| 20 steers, net weight, 20,500 pounds, at \$.048 per lb. .... | \$ | 984.00 |
| <hr/>                                                        |    |        |
| Profits—Total.....                                           | \$ | 139.17 |
| Profits—per Steer.....                                       | \$ | 6.96   |

The above table shows a very fair profit upon the transaction being almost \$7.00 per head. When all the factors are taken into consideration, this is a very safe margin and should offer encouragement to farmers for the feeding of beef cattle upon grasses since there are so many factors affecting this transaction to make it unsuccessful financially. The steers were purchased at a maximum price, the grazing proved to be sparse, the time in transit to market inordinately long and they were sold upon a crowded market.

This margin of \$6.96 per steer may be looked upon either as a profit or preferably and more fairly as a return for pasturage and represents a splendid return for the use of all such land as can not be easily devoted to crop production.

### Cotton-Seed Meal with Grass vs. Cotton-Seed Meal with Hulls.

During the winter of 1908-09 one lot of 22 steers of the same age and approximate weight as the lot considered in this bulletin were fed for a period of 89 days upon cotton-seed meal and hulls. The



results were reported in bulletin 121 and from that source data is here taken for comparison.

|                                     | Daily Gain. | Cost per lb.<br>Gain. | Pound of<br>C-S. Meal per<br>lb. Gain. | Pound of<br>Hulls per lb.<br>Gain. |
|-------------------------------------|-------------|-----------------------|----------------------------------------|------------------------------------|
| Winter 1908-09.....                 | 2.06        | 6.49                  | 2.82                                   | 12.71                              |
| Grass feeding,<br>Summer 1909 ..... | 1.26        | 5.38                  | 3.26                                   | 3.28                               |

The above table brings out the essential points of comparison. It shows that greater daily gains were obtained at a considerably greater cost by the feeding of hulls instead of grass. This actual cost as shown in the table does not fully bring out the difference in real cost since the meal in the winter feeding cost but \$23.50 per ton while in the summer feeding it cost \$28.00 per ton. The table further shows that this increased cost was produced by the use of the hulls since really less meal was consumed per pound gain in the winter than in the summer feeding. It is the opinion of the writer that future experiments will not bear out the conclusions that are to be drawn in regard to daily gains and meal necessary to produce a pound of gain. The unfavorable conditions that were unavoidable this year in grazing conditions decreased daily gains and consequently increased the cost of the same. But the feature of cheaper gains by summer feeding is forcibly demonstrated in this comparison and the writer believes will always hold true. By the feeding of steers upon grass the feeder avoids the almost useless and extremely large bill which is created by the use of hulls as roughage.

This elimination of the cost of hulls from the feeding of beef animals makes the undertaking of beef production an almost perfectly safe proposition for any farmer and indicates plainly the course to follow which is the production of beef upon grass.

#### Conclusions.

This experiment demonstrates clearly:

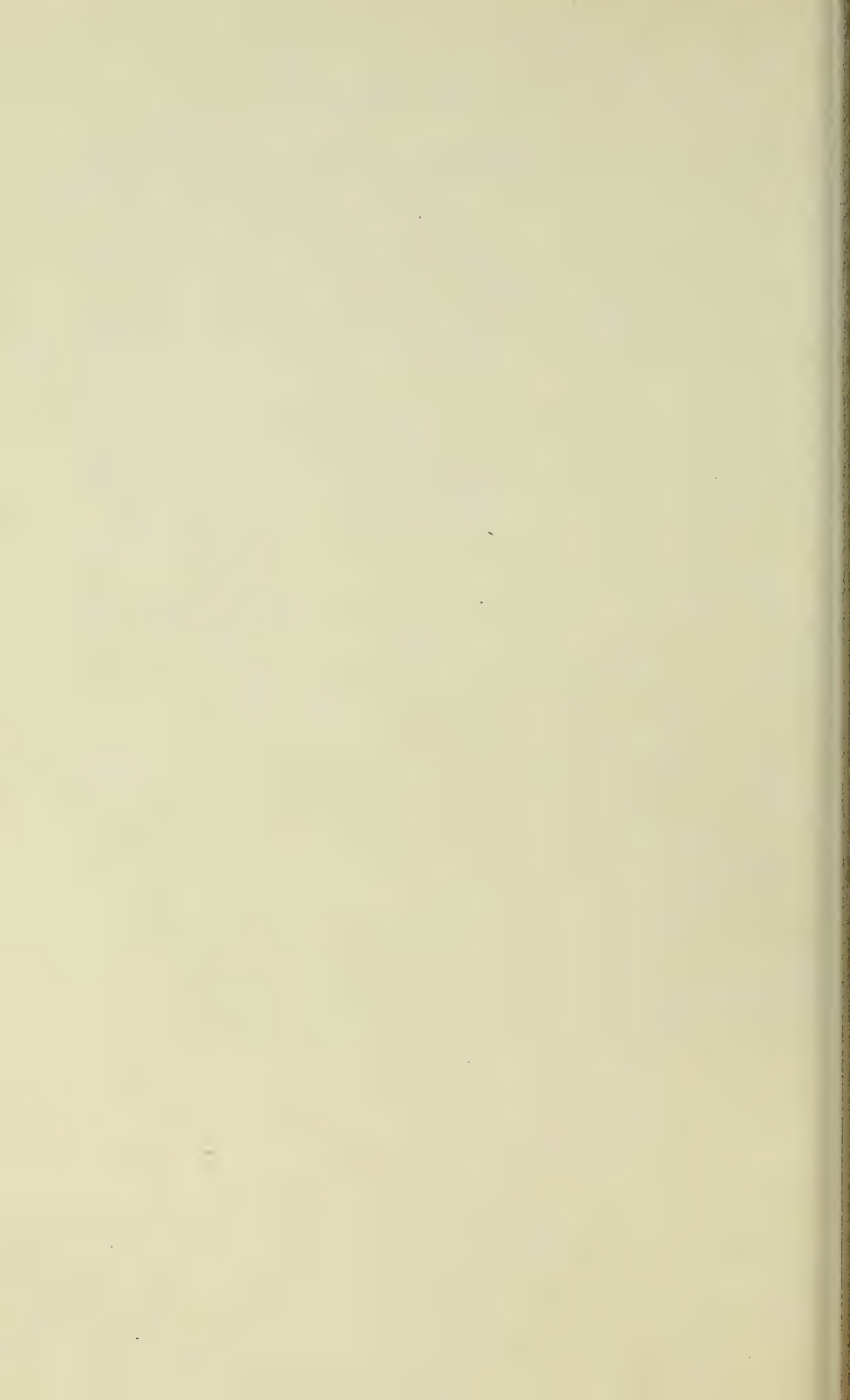
- I. That cotton-seed meal can be used in feeding beef steers upon grass without any deleterious effects.
- II. That good daily gains are obtainable in beef steers fed cotton-seed meal upon pasture.

III. That a very good margin of profit is obtainable from feeding average grade steers raised in Mississippi upon cotton-seed meal in pasture.

When compared with the results recorded in bulletin 121 this experiment clearly demonstrates:

IV. That grass is a much cheaper roughage than cotton-seed hulls to feed in conjunction with cotton-seed meal to beef steers and that consequently,

V. It is a safer business proposition and likely to be a more remunerative transaction to make beef during the summer months in Mississippi by feeding cotton-seed meal upon pasture than by feeding with hulls in the winter.



Mississippi Agricultural Experiment Station  
Agricultural College, Mississippi.

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BULLETIN No. 137.

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INSPECTION AND ANALYSES  
OF COMMERCIAL FEEDING STUFFS  
ON SALE IN THE STATE.



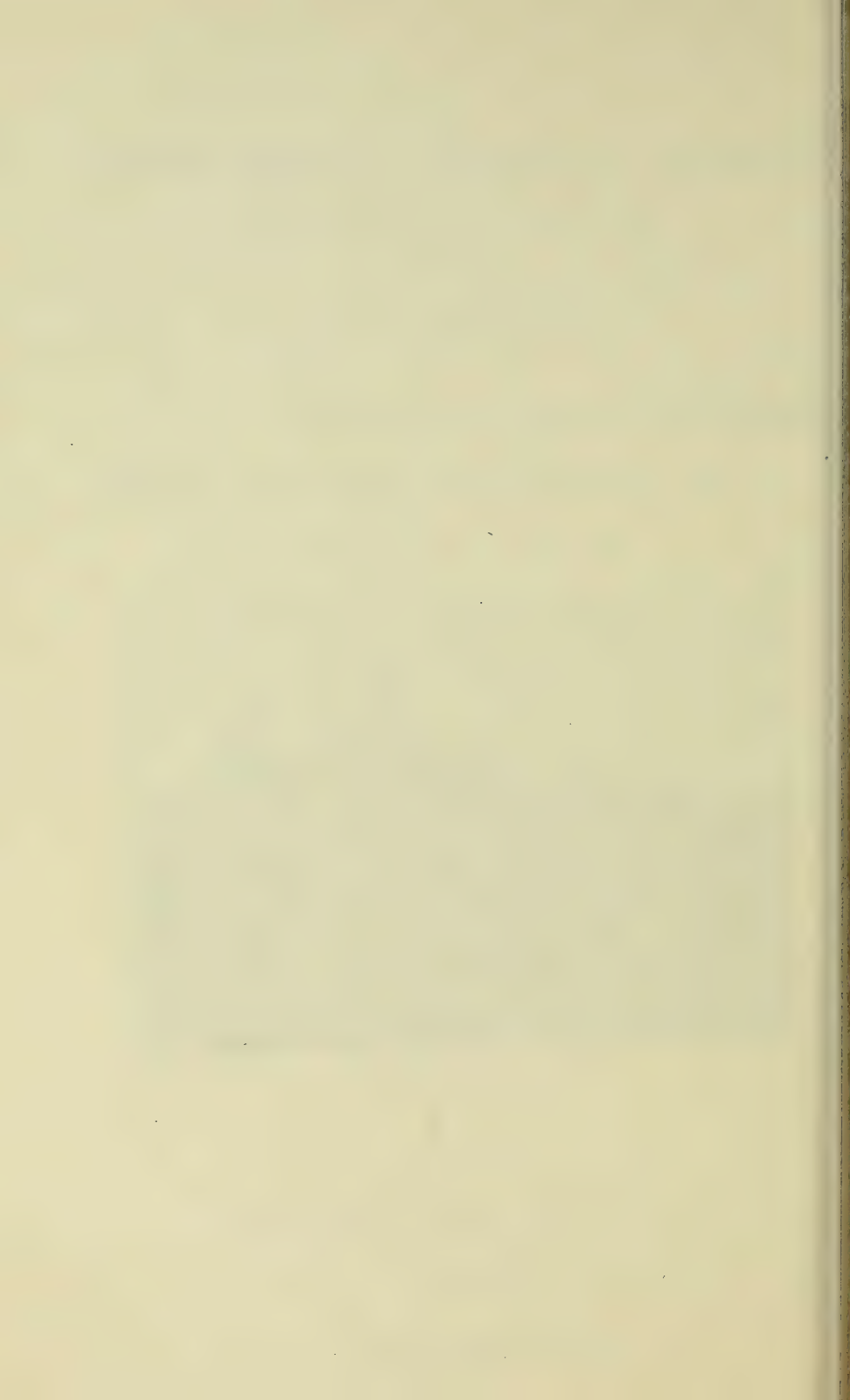
CHEMICAL LABORATORY.

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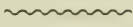
AGRICULTURAL COLLEGE, MISSISSIPPI

APRIL, 1910.





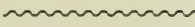
MISSISSIPPI FERTILIZER AND FEEDING  
STUFF CONTROL.



*Inspection and Analyses of Feeding Stuffs*

BY THE CHEMICAL DEPARTMENT OF THE

Mississippi Agricultural and Mechanical College.



|                      |                   |
|----------------------|-------------------|
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# THE INSPECTION

## —OF—

### COMMERCIAL FEEDING STUFFS

Season 1909-1910.

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#### INTRODUCTION.

This bulletin contains analyses of samples of commercial feeding stuffs and of mixed feeds drawn by regular inspectors of the Department. It is scarcely necessary to state that inspectors must exercise the greatest care in taking samples from shipments found in the hands of dealers, because the fairness and efficiency of this system of inspection rest primarily upon the representative character of these samples.

The table of analyses ought to be carefully inspected by buyers of feed. The purchase of a feed simply because it is cheap is plainly irrational. The price per ton will not be considered by the careful buyer until he first ascertains the composition of the feed itself, and in the case of mixed feeds, he will naturally wish to know what materials are employed in making the mixture. Dealers who consider the interest of their customers in the proper way should always endeavor to handle the best feeds obtainable for the price paid, and they ought to receive the encouragement and support of intelligent feeders if there be a tendency anywhere to urge the sale of the cheaper grades of feed in competition with those of better quality. Only feeds of the same class may be brought into competition fairly in so far as the price at which they are sold is concerned.

**Selling price and composition.**—The value of a ton of any kind of feed is measured by the amounts of digestible nutrients (fat, protein and carbohydrates) which it contains in palatable form.

The most expensive nutrients of any feed are fat and protein and, therefore, by-products or mixed feeds carrying large percentages of these nutrients cannot be sold for a relatively low price per ton.

The fiber of feeds consists of the woody portion which is not very digestible. A certain amount of fiber is essential, but buyers cannot afford to pay a high price for it, because it can be obtained cheaply.

in common hays, straws, cottonseed hulls, etc. The more concentrated feeds cannot contain a high percentage of fiber.

Corn and the cereals generally are rich in carbohydrates. Carbohydrate feeds can be produced on the farm. It is often necessary, however, to purchase by-products, e. g., cottonseed meal, wheat bran, gluten meal, brewers' dried grains, etc., which are rich in protein, that a properly balanced ration may be compounded. The leguminous hays are also comparatively rich in protein and many manufacturers are now securing a large proportion of protein in their feeds from this source.

If the purchaser fails to compare the guaranteed analyses and selling prices of the feeds offered him, he cannot avoid costly mistakes. **He should assure himself that the feed selected at a certain price contains as much protein and fat (and no more crude fiber) as any other palatable and adaptable feed that he can buy at the same price.**

**General results.**—This bulletins the analyses of 175 samples, and, omitting the samples of corn chops sold under a guarantee, only four samples out of the entire number are below the guarantee in both fat and protein. One sample is 10% below guarantee in protein and eight samples are 10% below in fat. The table contains no analyses of samples 10% below guarantee in the sum of fat and protein. The results, therefore, are distinctly encouraging. The careful manufacturer will always maintain a safe margin between his guarantee and the actual average composition of his products, that there may occur few if any deficiencies resulting from variations in composition of raw materials, mixing, and in sampling.

**Preservation of samples.**—The Department preserves all samples carefully for several months. A portion of any sample will be cheerfully sent the manufacturer who desires to have the analytical work done here checked by the analysis of any private or official chemist.



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                 | Where and from Whom Collected.                             |
|--------------------|-----------------------------------------------------------------|------------------------------------------------------------|
|                    | <b>ALFALFA FEED MILLS,</b><br>Nashville, Tenn.                  |                                                            |
| 12685              | Evergreen Feed .....                                            | McLelland & Smith, Jackson.....<br>Guarantee.....          |
|                    | <b>ALLEN-BAKER COMMISSION COMPANY,</b><br>St. Louis, Mo.        |                                                            |
| 12686              | Wheat Bran .....                                                | J. E. Miller, Leakesville.....<br>(No guarantee submitted) |
|                    | <b>AMERICAN MILLING COMPANY,</b><br>Chicago, Ill.               |                                                            |
| 12687              | Sucrene Dairy Feed .....                                        | Capital Grocery Co., Jackson.....                          |
| 12688              | Sucrene Dairy Feed .....                                        | C. J. Edwards Co., Vicksburg.....                          |
| 12689              | Sucrene Dairy Feed .....                                        | McLellan & Smith, Jackson.....<br>Guarantee.....           |
| 12690              | Sucrene Horse & Mule Feed ..                                    | Capital Grocery Co., Jackson.....                          |
| 12691              | Sucrene Horse & Mule Feed ..                                    | C. J. Edwards Co., Vicksburg.....                          |
| 12692              | Sucrene Horse & Mule Feed ..                                    | C. J. Edwards Co., Vicksburg.....<br>Guarantee.....        |
|                    | <b>ARLINGTON ROLLER MILLS,</b><br>Arlington, Ky.                |                                                            |
| 12693              | Bran .....                                                      | D. W. Wilkinson & Bro., Jackson.....                       |
| 12694              | Bran .....                                                      | D. W. Wilkinson & Bro., Jackson.....<br>Guarantee.....     |
|                    | <b>BALLARD &amp; BALLARD COMPANY</b><br>Louisville, Ky.         |                                                            |
| 12695              | Ballard's Shipstuff .....                                       | Capital Grocery Co., Jackson.....<br>Guarantee.....        |
|                    | <b>C. BECKER MILLING COMPANY,</b><br>Red Bud, Ill.              |                                                            |
| 12696              | Wheat Bran .....                                                | Leakesville Merc. Co., Leakesville.....<br>Guarantee.....  |
| 12697              | Wheat Shorts.....                                               | Davis & Chandler, West Point.....                          |
| 12698              | Wheat Shorts.....                                               | McInnis Bros., Moss Point.....<br>Guarantee.....           |
|                    | <b>MARCUS BERNHEIMER FLOUR MILLS COMPANY,</b><br>St. Louis, Mo. |                                                            |
| 12699              | Banner Middlings .....                                          | Queen City Feed Co., Meridian.....<br>Guarantee.....       |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12685              | 5.24               | 4.17          | 2.98<br>3.50        | 11.69<br>12.00          | 63.67<br>50.00          | 12.25<br>12.00        |
| 12686              | 5.30               | 6.30          | 4.16                | 16.13                   | 59.94                   | 8.17                  |
| 12687              | 11.91              | 9.63          | 4.24                | 18.56                   | 45.69                   | 9.97                  |
| 12688              | 12.14              | 10.15         | 4.94                | 19.06                   | 43.77                   | 9.94                  |
| 12689              | 10.46              | 9.88          | 4.25<br>3.50        | 17.38<br>16.50          | 46.62<br>46.00          | 11.41<br>12.00        |
| 12690              | 12.09              | 7.42          | 3.70                | 10.19                   | 58.38                   | 8.22                  |
| 12691              | 12.78              | 6.93          | 3.56                | 9.38                    | 57.81                   | 9.54                  |
| 12692              | 11.37              | 6.87          | 3.02<br>3.50        | 9.31<br>10.00           | 62.14<br>50.00          | 7.29<br>12.00         |
| 12693              | 9.80               | 6.63          | 4.86                | 15.44                   | 55.09                   | 8.18                  |
| 12694              | 8.50               | 6.67          | 4.13<br>4.00        | 14.94<br>14.00          | 56.81<br>52.00          | 8.95<br>9.00          |
| 12695              | 4.50               | 4.69          | 4.27<br>3.75        | 17.31<br>15.69          | 63.81<br>55.00          | 5.42<br>6.87          |
| 12696              | 6.80               | 3.43          | 5.08<br>3.58        | 18.50<br>14.50          | 62.08<br>52.00          | 4.11<br>10.00         |
| 12697              | 9.70               | 5.06          | 5.53                | 18.56                   | 55.91                   | 5.24                  |
| 12698              | 10.82              | 3.60          | 4.72<br>4.20        | 17.50<br>15.50          | 59.25<br>60.30          | 4.11<br>3.70          |
| 12699              | 7.08               | 2.47          | 4.53<br>4.00        | 18.63<br>15.00          | 63.92<br>55.00          | 3.37<br>5.00          |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                          |
|--------------------|----------------------------------------------------------|---------------------------------------------------------|
|                    | <b>BROWDER MILLING COMPANY,</b><br>Fulton, Ky.           |                                                         |
| 12700              | Mixed Feed .....                                         | Merchants Grocery Co., Crystal Sp'gs<br>Guarantee.....  |
|                    | <b>CAPITAL GRAIN &amp; MILL CO.,</b><br>Nashville, Tenn. |                                                         |
| 12701              | Alfacorn Feed .....                                      | Merchants Grocery Co., Hattiesburg...<br>Guarantee..... |
|                    | <b>CHARLESTON MILLING CO.,</b><br>Charleston, Mo.        |                                                         |
| 12702              | Bran .....                                               | Bay Grain Company, Bay St. Louis...<br>Guarantee.....   |
|                    | <b>CLEVELAND BROTHERS,</b><br>Mobile, Ala.               |                                                         |
| 12703              | Wheat Shorts.....                                        | De Jean Mitchell, Scranton.....<br>Guarantee.....       |
|                    | <b>COLUMBIA STAR MILLING CO.,</b><br>Columbia, Ill.      |                                                         |
| 12704              | Wheat Bran .....                                         | Hood Milling Co., Gulfport.....<br>Guarantee.....       |
| 12705              | Wheat Middlings .....                                    | Hood Milling Co., Gulfport.....<br>Guarantee.....       |
|                    | <b>CORNO MILLS COMPANY,</b><br>St. Louis, Mo.            |                                                         |
| 12706              | Corno Hen Feed .....                                     | E. W. Troutman, Long Beach.....                         |
| 12707              | Corno Hen Feed .....                                     | Yazoo Grocery Co., Yazoo City.....<br>Guarantee.....    |
| 12708              | Corno Horse & Mule Feed .....                            | Hannah Distributing Co., Jackson.....                   |
| 12709              | Corno Horse & Mule Feed .....                            | Greenwood Grocery Co., Greenwood...                     |
| 12710              | Corno Horse & Mule Feed .....                            | Barrett Grocery Co., Lexington.....                     |
| 12711              | Corno Horse & Mule Feed .....                            | Hannah Distributing Co., Jackson.....                   |
| 12712              | Corno Horse & Mule Feed .....                            | Yazoo Grocery Co., Yazoo City.....                      |
| 12713              | Corno Horse & Mule Feed .....                            | Greenwood Grocery Co., Greenwood...                     |
| 12714              | Corno Horse & Mule Feed .....                            | Crawford Grocery Co., Greenville.....                   |
| 12715              | Corno Horse & Mule Feed .....                            | A. J. Lyons & Co., Meridian.....<br>Guarantee.....      |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12700              | 10.59              | 5.32          | 4.45<br>4.25        | 17.63<br>15.90          | 56.37<br>54.00          | 5.64<br>9.00          |
| 12701              | 9.47               | 5.06          | 3.21<br>3.50        | 10.75<br>10.00          | 62.01<br>54.00          | 9.50<br>12.00         |
| 12702              | 8.32               | 6.75          | 4.84<br>4.75        | 19.13<br>13.10          | 53.16<br>54.50          | 7.80<br>9.20          |
| 12703              | 9.15               | 5.15          | 4.15<br>3.50        | 18.31<br>12.00          | 57.95<br>50.00          | 5.29<br>10.50         |
| 12704              | 8.96               | 7.20          | 4.19<br>3.74        | 16.13<br>15.26          | 54.96<br>53.38          | 8.56<br>9.21          |
| 12705              | 7.79               | 4.52          | 4.90<br>5.02        | 16.81<br>15.26          | 61.15<br>60.47          | 4.83<br>3.75          |
| 12706              | 10.56              | 1.53          | 3.74                | 10.81                   | 71.66                   | 1.70                  |
| 12707              | 11.56              | 1.62          | 3.40<br>3.70        | 10.44<br>10.00          | 71.32<br>70.00          | 1.66<br>2.30          |
| 12708              | 4.79               | 4.30          | 4.45                | 11.13                   | 64.07                   | 11.26                 |
| 12709              | 4.22               | 4.16          | 3.50                | 11.13                   | 65.21                   | 11.78                 |
| 12710              | 5.37               | 3.65          | 3.60                | 10.13                   | 67.21                   | 10.04                 |
| 12711              | 5.77               | 3.92          | 3.81                | 12.44                   | 66.42                   | 7.64                  |
| 12712              | 4.20               | 3.40          | 3.72                | 11.31                   | 66.66                   | 10.71                 |
| 12713              | 4.56               | 3.47          | 3.97                | 11.81                   | 67.29                   | 8.90                  |
| 12714              | 10.68              | 3.35          | 3.55                | 11.13                   | 63.31                   | 7.98                  |
| 12715              | 9.35               | 3.79          | 3.50<br>3.50        | 11.06<br>10.00          | 64.23<br>58.50          | 8.07<br>12.00         |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                             |
|--------------------|---------------------------------------------------------|------------------------------------------------------------|
|                    | <b>DAHNIKE-WALKER MILLING CO.,</b><br>Union City, Tenn. |                                                            |
| 12716              | Wheat Bran .....                                        | Merchants Grocery Co., Hattiesburg...                      |
| 12717              | Wheat Bran .....                                        | Clark Grocery Co., Tupelo.....                             |
| 12718              | Wheat Bran .....                                        | Crawford Grocery Co., Greenville.....<br>Guarantee.....    |
|                    | <b>DAVIS &amp; ANDREWS COMPANY,</b><br>Memphis, Tenn.   |                                                            |
| 12719              | Corn Chops.....                                         | Greenwood Grocery Co., Greenwood...                        |
| 12720              | Corn Chops.....                                         | The Goyer Co., Greenville.....<br>(No guarantee submitted) |
|                    | <b>J. B. EDGAR GRAIN COMPANY,</b><br>Memphis, Tenn.     |                                                            |
| 12721              | Ceralfa Stock Feed .....                                | Crawford Grocery Co., Greenville.....<br>Guarantee.....    |
|                    | <b>EDWARDSVILLE MILLING CO.,</b><br>Edwardsville, Ill.  |                                                            |
| 12722              | Wheat Bran .....                                        | The Mississippi Co., Canton.....<br>Guarantee.....         |
| 12349              | Wheat Middlings .....                                   | Clay County Cotton Oil Co., West Point<br>Guarantee.....   |
|                    | <b>FREEBURG MILLING CO.,</b><br>Freeburg, Ill.          |                                                            |
| 12723              | Wheat Bran .....                                        | Foote-Patrick Co., Laurel.....<br>Guarantee.....           |
|                    | <b>FORKED DEER MILLING CO.,</b><br>Dyersburg, Tenn.     |                                                            |
| 12724              | Wheat Bran .....                                        | T. S. Cunningham, Aberdeen.....<br>Guarantee.....          |
|                    | <b>A. H. GEORGE &amp; COMPANY,</b><br>Meridian, Miss.   |                                                            |
| 12725              | George's Mixed Rice Shorts ..                           | A. H. George & Co., Meridian.....<br>Guarantee.....        |
| 12726              | George's Prepared Cow and<br>Cattle Feed.....           | A. H. George & Co., Meridian.....<br>Guarantee.....        |
|                    | <b>J. T. GIBBONS,</b><br>New Orleans, La.               |                                                            |
| 12727              | Wheat Bran .....                                        | Bay Grain Company, Bay St. Louis....<br>Guarantee.....     |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12716              | 9.21               | 5.97          | 4.00                | 13.44                   | 59.24                   | 8.14                  |
| 12717              | 11.11              | 6.32          | 4.02                | 14.44                   | 55.71                   | 8.30                  |
| 12718              | 9.21               | 5.58          | 4.86                | 14.06                   | 58.35                   | 8.24                  |
|                    |                    |               | 3.95                | 14.00                   | 55.00                   | 10.50                 |
| 12719              | 12.80              | 1.12          | 3.56                | 7.25                    | 74.01                   | 1.26                  |
| 12720              | 12.53              | 1.52          | 4.15                | 8.13                    | 72.17                   | 1.50                  |
| 12721              | 9.41               | 7.40          | 4.36                | 12.56                   | 60.12                   | 6.15                  |
|                    |                    |               | 4.00                | 13.00                   | 55.00                   | 11.50                 |
| 12722              | 10.51              | 6.44          | 3.80                | 14.88                   | 55.87                   | 8.50                  |
|                    |                    |               | 3.50                | 14.00                   | 54.00                   | 9.05                  |
| 12349              | 8.44               | 1.40          | 5.38                | 17.69                   | 62.60                   | 4.94                  |
|                    |                    |               | 4.45                | 16.90                   | 58.80                   | 4.20                  |
| 12723              | 11.57              | 5.87          | 4.74                | 18.13                   | 52.44                   | 7.25                  |
|                    |                    |               | 3.50                | 14.00                   | 54.00                   | 9.50                  |
| 12724              | 11.05              | 5.45          | 4.65                | 16.69                   | 55.79                   | 6.37                  |
|                    |                    |               | 3.79                | 15.47                   | 58.86                   | 7.27                  |
| 12725              | 11.96              | 3.95          | 8.32                | 10.13                   | 57.60                   | 8.04                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 6.50                  |
| 12726              | 6.47               | 4.09          | 4.02                | 13.44                   | 44.95                   | 27.03                 |
|                    |                    |               | 4.00                | 11.00                   | 38.00                   | 40.00                 |
| 12727              | 9.39               | 6.43          | 3.88                | 15.88                   | 56.11                   | 8.31                  |
|                    |                    |               | 3.75                | 13.00                   | 55.50                   | 10.00                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                                            | Where and from Whom Collected.                          |
|--------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------|
| 12728              | <b>B. F. GLOVER &amp; SON COMMISSION COMPANY,</b><br>New Orleans, La.<br>Rice Polish ..... | Hattiesburg Grocery Co., Hattiesburg<br>Guarantee.....  |
| 12729              | <b>GOOD LUCK MILLS,</b><br>St. Louis, Mo.<br>Good Luck Feed .....                          | The Goyer Company, Greenville.....<br>Guarantee.....    |
|                    | <b>GREAT WESTERN CEREAL CO.,</b><br>Chicago, Ill.                                          |                                                         |
| 12730              | Boss Chop Feed .....                                                                       | Taylor Wills Grocery Co., Jackson.....                  |
| 12731              | Boss Chop Feed .....                                                                       | Southern Commission Co., Greenville<br>Guarantee.....   |
| 12732              | Daisy Dairy Feed .....                                                                     | Taylor Wills Grocery Co., Jackson...                    |
| 12733              | Daisy Dairy Feed .....                                                                     | R. H. Greene & Bro., Jackson.....<br>Guarantee.....     |
| 12734              | Excelsior Chop Feed.....                                                                   | C. J. Edwards Co., Vicksburg.....<br>Guarantee.....     |
| 12735              | Maizefalfa .....                                                                           | R. H. Green & Bro., Jackson.....                        |
| 12736              | Maizefalfa .....                                                                           | R. H. Green & Bro., Jackson.....<br>Guarantee.....      |
| 12737              | Sterling Scratch Feed .....                                                                | R. H. Green & Bro., Jackson.....                        |
| 12738              | Sterling Scratch Feed .....                                                                | Southern Commission Co., Greenville<br>Guarantee.....   |
| 12739              | <b>GULFPORT GROCERY CO.,</b><br>Gulfport, Miss.<br>Mile Post .....                         | Biloxi Milling Co., Biloxi.....<br>Guarantee.....       |
|                    | <b>H. L. HALLIDAY MILLING CO.,</b><br>Cairo, Ill.                                          |                                                         |
| 12740              | Wheat Bran .....                                                                           | W. A. McDonald, Bay St. Louis.....                      |
| 12741              | Wheat Bran .....                                                                           | Gulfport Grocery Co., Gulfport.....<br>Guarantee.....   |
|                    | <b>HANNAH DISTRIBUTING CO.,</b><br>Jackson, Miss.                                          |                                                         |
| 12742              | Wheat Bran .....                                                                           | Hannah Distributing Co., Jackson.....<br>Guarantee..... |
| 12743              | Mixed Feed .....                                                                           | Hannah Distributing Co., Jackson.....<br>Guarantee..... |
| 12744              | Rice Polish.....                                                                           | Hannah Distributing Co., Jackson.....<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12728              | 11.93              | 5.46          | 9.52<br>10.17       | 10.94<br>10.53          | 60.44<br>62.40          | 1.71<br>1.20          |
| 12729              | 7.89               | 4.85          | 4.80<br>3.80        | 12.38<br>10.00          | 59.74<br>59.20          | 10.34<br>11.90        |
| 12730              | 10.66              | 3.99          | 5.39                | 10.44                   | 63.44                   | 6.08                  |
| 12731              | 11.11              | 4.26          | 5.97<br>4.00        | 10.44<br>9.50           | 62.38<br>60.00          | 5.84<br>10.00         |
| 12732              | 18.95              | 7.49          | 2.99                | 14.94                   | 41.29                   | 14.34                 |
| 12732              | 8.66               | 8.05          | 3.25<br>3.50        | 18.31<br>15.00          | 51.67<br>50.00          | 10.06<br>12.00        |
| 12734              | 10.47              | 4.19          | 5.77<br>4.00        | 11.25<br>9.50           | 63.51<br>60.00          | 4.81<br>10.00         |
| 12735              | 9.27               | 3.99          | 4.81                | 11.63                   | 63.86                   | 6.44                  |
| 12736              | 9.50               | 4.53          | 5.46<br>4.00        | 12.19<br>10.00          | 61.44<br>60.00          | 6.88<br>11.00         |
| 12737              | 12.88              | 1.65          | 3.05                | 10.00                   | 70.52                   | 1.90                  |
| 12738              | 12.08              | 1.56          | 3.24<br>3.50        | 10.44<br>10.00          | 70.80<br>65.00          | 1.88<br>4.00          |
| 12739              | 11.24              | 5.37          | 3.68<br>3.50        | 11.94<br>10.00          | 60.04<br>57.50          | 7.73<br>12.00         |
| 12740              | 10.37              | 6.06          | 4.70                | 16.81                   | 54.24                   | 7.82                  |
| 12741              | 10.55              | 6.10          | 4.75<br>4.00        | 16.31<br>14.00          | 55.50<br>55.00          | 6.79<br>8.50          |
| 12742              | 9.86               | 5.71          | 4.54<br>3.50        | 16.25<br>10.00          | 56.28<br>50.00          | 7.36<br>12.00         |
| 12743              | 8.75               | 5.77          | 5.60<br>3.50        | 17.75<br>10.00          | 55.27<br>50.00          | 6.86<br>12.00         |
| 12744              | 14.03              | 7.04          | 10.79<br>5.50       | 11.31<br>11.20          | 54.21<br>52.00          | 2.62<br>4.00          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                                                 | Where and from Whom Collected.                                                                    |
|--------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 12934              | <b>HARRIS &amp; COMPANY,</b><br><b>Meridian, Miss.</b><br>Tip Top Prepared Cattle<br>Feed ..... | Harris & Company, Meridian.....<br>Guarantee.....                                                 |
| 12745              | <b>HARTFIELD &amp; COOK,</b><br><b>Memphis, Tenn.</b><br>Corn Chops.....                        | R. H. Green & Bro., Jackson.....<br>(No guarantee submitted)                                      |
| 12746              | <b>HOOD MILLING COMPANY,</b><br><b>Gulfport, Miss.</b><br>Grain Special Horse Feed .....        | Hood Milling Co., Gulfport.....<br>Guarantee.....                                                 |
| 12747<br>12748     | <b>J. B. HORTON,</b><br><b>Memphis, Tenn.</b><br>Chops .....<br>Corn Chops.....                 | R. H. Green & Bro., Jackson.....<br>Capital Grocery Co., Jackson.....<br>(No guarantee submitted) |
| 12749              | <b>J. B. HOWIE &amp; COMPANY,</b><br><b>Gulfport, Miss.</b><br>Corn Chops.....                  | M. M. Moody, Long Beach.....<br>(No guarantee submitted)                                          |
|                    | <b>THE HUNTER BROS. MILLING</b><br><b>COMPANY,</b><br><b>St. Louis, Mo.</b>                     |                                                                                                   |
| 12750              | Wheat Bran .....                                                                                | C. J. Edwards, Vicksburg.....                                                                     |
| 12751              | Pure Wheat Bran .....                                                                           | J. K. Henley, Biloxi.....                                                                         |
| 12752              | Pure Wheat Bran .....                                                                           | L. Lopez & Co., Biloxi.....                                                                       |
| 12753              | Pure Wheat Bran .....                                                                           | Guy Northrop, Pass Christian.....                                                                 |
| 12754              | Pure Wheat Bran .....                                                                           | The Goyer Company, Greenville.....<br>Guarantee.....                                              |
| 12755              | Pure Wheat Middlings .....                                                                      | Hood Milling Co., Gulfport.....                                                                   |
| 12756              | Pure Wheat Middlings .....                                                                      | M. M. Moody, Long Beach.....                                                                      |
| 12757              | Pure Wheat Middlings .....                                                                      | The Goyer Company, Greenville.....                                                                |
| 12758              | Pure Wheat Middlings .....                                                                      | Walton Bros., Newton.....                                                                         |
| 12759              | Pure Wheat Middlings .....                                                                      | J. C. McClinton, Newton.....                                                                      |
| 12760              | Pure Wheat Middlings .....                                                                      | Meyer Bros., Meridian.....                                                                        |
| 12761              | Pure Wheat Middlings .....                                                                      | D. W. Wilkinson & Bro., Jackson.....<br>Guarantee.....                                            |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12934              | 7.82               | 4.13          | 3.84<br>3.50        | 15.63<br>12.50          | 37.95<br>29.24          | 30.63<br>33.81        |
| 12745              | 8.99               | 1.44          | 4.38                | 9.88                    | 73.79                   | 1.52                  |
| 12746              | 8.00               | 3.81          | 3.67<br>3.50        | 11.69<br>10.25          | 65.67<br>55.00          | 7.16<br>12.00         |
| 12747              | 8.10               | 1.45          | 4.46                | 8.88                    | 75.75                   | 1.36                  |
| 12748              | 10.16              | 1.44          | 4.43                | 8.38                    | 72.29                   | 3.30                  |
| 12749              | 10.51              | 1.52          | 4.56                | 8.25                    | 71.96                   | 3.20                  |
| 12750              | 7.23               | 6.08          | 4.63                | 16.56                   | 57.93                   | 7.57                  |
| 12751              | 7.36               | 6.52          | 5.22                | 16.94                   | 56.88                   | 7.08                  |
| 12752              | 4.91               | 6.48          | 4.93                | 16.88                   | 59.31                   | 7.49                  |
| 12753              | 4.05               | 7.09          | 4.50                | 17.94                   | 58.70                   | 7.72                  |
| 12754              | 4.75               | 7.28          | 4.39<br>3.50        | 19.00<br>14.00          | 56.52<br>54.00          | 8.06<br>10.00         |
| 12755              | 4.35               | 5.10          | 5.18                | 17.44                   | 62.35                   | 5.58                  |
| 12756              | 6.00               | 4.76          | 4.80                | 17.25                   | 61.84                   | 5.35                  |
| 12757              | 5.79               | 5.15          | 5.63                | 20.31                   | 58.38                   | 4.74                  |
| 12758              | 4.62               | 4.79          | 5.07                | 19.31                   | 61.03                   | 5.18                  |
| 12759              | 3.99               | 4.86          | 6.42                | 20.31                   | 59.23                   | 5.19                  |
| 12760              | 5.39               | 4.01          | 5.67                | 20.31                   | 60.17                   | 4.45                  |
| 12761              | 2.58               | 5.38          | 5.80<br>4.00        | 19.88<br>16.00          | 58.25<br>56.00          | 8.11<br>9.00          |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                           | Where and from Whom Collected.                              |
|--------------------|---------------------------------------------------------------------------|-------------------------------------------------------------|
|                    | <b>HUNTER-ROBINSON-WENZ<br/>MILLING COMPANY,<br/>St. Louis, Mo.</b>       |                                                             |
| 12762              | "Rustic" Wheat Midds .....                                                | A. B. Voyle, Corinth.....                                   |
| 12763              | "Rustic" Wheat Midds .....                                                | C. A. Turner, Corinth.....<br>Guarantee.....                |
|                    | <b>HUTCHINSON ALFALFA PROD-<br/>UCTS COMPANY,<br/>Hutchinson, Kansas.</b> |                                                             |
| 12764              | Hopco Horse & Mule Feed ...                                               | Hannah Distributing Co., Jackson.....<br>Guarantee.....     |
|                    | <b>ILLINOIS FEED MILLS,<br/>St. Louis, Mo.</b>                            |                                                             |
| 12765              | Star Feed .....                                                           | Delta Grocery & Cotton Co., Greenw'd                        |
| 12766              | Star Feed .....                                                           | Blackstone-Smith Co., Greenwood.....                        |
| 12767              | Star Feed .....                                                           | Delta Grocery & Cotton Co., Clarksdale<br>Guarantee.....    |
|                    | <b>INTERSTATE MILLING CO.,<br/>Memphis, Tenn.</b>                         |                                                             |
| 12768              | Sugaration Stock Feed .....                                               | Clark Grocery Co., Tupelo.....<br>Guarantee.....            |
|                    | <b>KEMPER MILL &amp; ELEVATOR<br/>COMPANY,<br/>Kansas City, Mo.</b>       |                                                             |
| 12769              | Shorts .....                                                              | Winner Klein & Co., Meridian.....<br>Guarantee.....         |
|                    | <b>HENRY A. KLYCE COMPANY,<br/>Dyersburg, Tenn.</b>                       |                                                             |
| 12935              | Chops .....                                                               | Myer Bros., Meridian.....                                   |
| 12936              | Chops .....                                                               | A. J. Lyons & Co., Meridian.....<br>Guarantee.....          |
|                    | <b>H. T. LAWLER MILLING CO.,<br/>New Orleans, La.</b>                     |                                                             |
| 12770              | Wheat Shorts.....                                                         | E. W. Troutman, Long Beach.....<br>(No guarantee submitted) |
|                    | <b>LAWRENCE &amp; HAMILTON FEED<br/>COMPANY,<br/>New Orleans, La.</b>     |                                                             |
| 12771              | Staforlife .....                                                          | Walton Bros., Newton.....                                   |
| 12772              | Staforlife .....                                                          | M. M. Moody, Long Beach.....                                |
| 12773              | Staforlife .....                                                          | Guy Northrop, Pass Christian.....                           |
| 12774              | Staforlife .....                                                          | A. Beer & Co., Natchez.....<br>Guarantee.....               |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12762              | 9.82               | 4.37          | 5.49                | 17.56                   | 57.34                   | 5.42                  |
| 12763              | 5.41               | 4.68          | 5.68<br>4.00        | 18.63<br>15.00          | 60.00<br>55.00          | 5.60<br>6.00          |
| 12764              | 7.76               | 3.80          | 3.45<br>4.00        | 12.38<br>12.00          | 64.38<br>58.00          | 8.23<br>11.00         |
| 12765              | 6.90               | 4.32          | 4.47                | 11.69                   | 65.35                   | 7.27                  |
| 12766              | 4.15               | 4.55          | 4.04                | 12.06                   | 67.68                   | 7.52                  |
| 12767              | 5.65               | 5.37          | 4.20<br>3.80        | 13.00<br>12.00          | 64.01<br>58.00          | 7.77<br>8.90          |
| 12768              | 10.86              | 5.59          | 3.47<br>3.60        | 11.56<br>11.65          | 62.11<br>64.40          | 6.41<br>11.40         |
| 12769              | 9.17               | 3.51          | 5.72<br>5.25        | 18.13<br>15.50          | 60.21<br>61.25          | 3.26<br>6.25          |
| 12935              | 14.30              | 1.43          | 4.96                | 7.94                    | 69.26                   | 2.11                  |
| 12936              | 12.33              | 1.48          | 5.33<br>4.75        | 7.81<br>8.75            | 70.90<br>70.00          | 2.15<br>5.00          |
| 12770              | 6.15               | 5.12          | 5.58                | 19.25                   | 58.97                   | 4.93                  |
| 12771              | 4.83               | 7.48          | 6.25                | 12.63                   | 59.44                   | 9.37                  |
| 12772              | 6.14               | 8.33          | 5.80                | 12.88                   | 56.94                   | 9.91                  |
| 12773              | 7.54               | 7.20          | 6.09                | 11.44                   | 57.98                   | 9.75                  |
| 12774              | 9.43               | 8.22          | 5.74<br>6.00        | 12.06<br>11.00          | 56.35<br>53.00          | 8.20<br>12.00         |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                       | Where and from Whom Collected.                                   |
|--------------------|-----------------------------------------------------------------------|------------------------------------------------------------------|
|                    | <b>LEONA RICE MILLING CO.,</b><br>New Orleans, La.                    |                                                                  |
| 12775              | Rice Bran .....                                                       | Clay County Cot. Oil Co., West Point<br>Guarantee.....           |
| 12776              | Rice Polish .....                                                     | Clay County Cot. Oil Co., West Point<br>Guarantee.....           |
|                    | <b>LIBERTY MILLS,</b><br>Nashville, Tenn.                             |                                                                  |
| 12777              | Wheat Bran .....                                                      | Tom Lyle Grocery Co., Meridian.....                              |
| 12778              | Wheat Bran .....                                                      | W. M. Canty, Scranton.....                                       |
| 12779              | Wheat Bran .....                                                      | McInnis Bros., Moss Point.....                                   |
| 12780              | Wheat Bran .....                                                      | Leakesville Merc. Co., Leakesville.....                          |
| 12781              | Wheat Bran .....                                                      | Greenwood Grocery Co., Greenwood.....<br>Guarantee.....          |
| 12510              | Wheat Shorts.....                                                     | J. L. Walker & Co., Columbus.....<br>Guarantee.....              |
|                    | <b>LOUISIANA FEED PRODUCTS</b><br><b>COMPANY,</b><br>Baton Rouge, La. |                                                                  |
| 12782              | Glover Horse Feed .....                                               | Bay Grain Co., Bay St. Louis.....<br>Guarantee.....              |
| 12783              | Miraman Horse Feed .....                                              | W. M. Canty, Scranton.....<br>(No guarantee submitted) (Illegal) |
|                    | <b>LUKENS MILLING COMPANY,</b><br>Atchinson, Kans.                    |                                                                  |
| 12784              | Wheat Bran .....                                                      | McLellan & Smith, Jackson.....                                   |
| 12785              | Wheat Bran .....                                                      | Taylor Wills Grocery Co., Jackson.....<br>Guarantee.....         |
| 12786              | Wheat Shorts.....                                                     | Taylor Wills Grocery Co., Jackson.....                           |
| 12787              | Wheat Shorts.....                                                     | McLellan & Smith, Jackson.....<br>Guarantee.....                 |
|                    | <b>GEO. B. MATTHEWS &amp; SONS,</b><br>New Orleans, La.               |                                                                  |
| 12788              | Rice Polish .....                                                     | J. S. Allred, Hazlehurst.....                                    |
| 12789              | Rice Polish .....                                                     | W. F. Funchess & Co., Osyka.....                                 |
| 12790              | Rice Polish .....                                                     | Wm. Atkinson & McDonald Co., Wess'n.....                         |
| 12791              | Rice Polish .....                                                     | R. H. Green & Bro., Jackson.....<br>Guarantee.....               |
|                    | <b>MILLSTADT MILLING CO.,</b><br>Millstadt, Ill.                      |                                                                  |
| 12792              | Wheat Bran .....                                                      | Threefoot Bros. & Co., Meridian.....                             |
| 12793              | Wheat Bran .....                                                      | Gulfport Grocery Co., Gulfport.....<br>Guarantee.....            |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent.  | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|----------------------|-------------------------|-------------------------|-----------------------|
| 12775              | 9.25               | 10.10         | 12.12<br><i>8.87</i> | 12.00<br><i>11.44</i>   | 46.96<br><i>53.55</i>   | 9.57<br><i>9.37</i>   |
| 12776              | 8.35               | 5.74          | 10.60<br><i>4.77</i> | 11.06<br><i>10.13</i>   | 62.33<br><i>69.23</i>   | 1.92<br><i>2.20</i>   |
| 12777              | 10.10              | 5.98          | 4.41                 | 15.25                   | 56.88                   | 7.38                  |
| 12778              | 9.20               | 7.10          | 4.53                 | 15.88                   | 55.24                   | 8.05                  |
| 12779              | 8.25               | 7.81          | 4.52                 | 16.19                   | 55.44                   | 7.79                  |
| 12780              | 8.79               | 6.42          | 4.44                 | 16.00                   | 56.82                   | 7.53                  |
| 12781              | 9.02               | 6.09          | 4.44<br><i>4.00</i>  | 15.69<br><i>14.50</i>   | 57.61<br><i>50.00</i>   | 7.15<br><i>9.50</i>   |
| 12510              | 10.61              | 4.83          | 5.49<br><i>4.00</i>  | 17.19<br><i>16.00</i>   | 55.29<br><i>48.00</i>   | 6.59<br><i>6.00</i>   |
| 12782              | 8.63               | 6.72          | 2.63<br><i>3.50</i>  | 11.25<br><i>10.00</i>   | 56.77<br><i>55.00</i>   | 14.00<br><i>12.00</i> |
| 12783              | 3.38               | 5.55          | 2.66                 | 12.50                   | 63.92                   | 11.99                 |
| 12784              | 7.63               | 6.77          | 4.68                 | 16.75                   | 55.53                   | 8.64                  |
| 12785              | 6.83               | 7.01          | 5.14<br><i>3.50</i>  | 17.31<br><i>11.00</i>   | 54.91<br><i>50.00</i>   | 8.80<br><i>12.00</i>  |
| 12786              | 9.04               | 5.43          | 5.11                 | 17.25                   | 57.30                   | 5.87                  |
| 12787              | 8.90               | 5.69          | 5.16<br><i>4.00</i>  | 17.63<br><i>13.00</i>   | 56.46<br><i>55.00</i>   | 6.16<br><i>9.00</i>   |
| 12788              | 9.67               | 4.64          | 9.34                 | 11.75                   | 63.64                   | .96                   |
| 12789              | 9.35               | 4.59          | 9.18                 | 11.31                   | 65.15                   | .42                   |
| 12790              | 9.36               | 3.06          | 6.72                 | 11.44                   | 68.93                   | .49                   |
| 12791              | 9.48               | 4.99          | 10.48<br><i>5.00</i> | 12.38<br><i>10.00</i>   | 61.80<br><i>50.00</i>   | .87<br><i>12.00</i>   |
| 12792              | 9.31               | 6.89          | 5.21                 | 16.06                   | 54.46                   | 8.07                  |
| 12793              | 9.95               | 7.11          | 4.84<br><i>3.50</i>  | 15.50<br><i>11.27</i>   | 51.64<br><i>59.54</i>   | 10.96<br><i>6.04</i>  |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number.                                                                                                | Name of Brand and Manufacturer.                        | Where and from Whom Collected.                            |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------|
| 12794                                                                                                             | <b>NEW ATHENS MILLING CO.,</b><br>New Athens, Ill.     |                                                           |
|                                                                                                                   | Middlings .....                                        | W. E. Laird, Hattiesburg.....<br>Guarantee.....           |
| 12795                                                                                                             | <b>PICKNEYVILLE MILLING CO.,</b><br>Pickneyville, Ill. |                                                           |
|                                                                                                                   | Pure Wheat Bran .....                                  | Merchants Grocery Co., Hazlehurst...<br>Guarantee.....    |
| 12796                                                                                                             | Pure Wheat Shorts .....                                | Merchants Grocery Co., Hazlehurst...<br>Guarantee.....    |
| 12797<br>12798<br>12799                                                                                           | <b>GEO. P. PLANT MILLING CO.,</b><br>St. Louis, Mo.    |                                                           |
|                                                                                                                   | Wheat Bran .....                                       | Geisenberger & Friedler, Natchez.....                     |
|                                                                                                                   | Wheat Bran .....                                       | A. G. Russell Co., Vicksburg.....                         |
|                                                                                                                   | Wheat Bran .....                                       | Geisenberger & Friedler, Natchez.....<br>Guarantee.....   |
| 12800                                                                                                             | <b>THE QUAKER OATS CO.,</b><br>Chicago, Ill.           |                                                           |
|                                                                                                                   | Banner Feed .....                                      | Geisenberger & Friedler, Natchez.....<br>Guarantee.....   |
| 12801<br>12802<br>12803<br>12804<br>12805<br>12806<br>12807<br>12808<br>12809<br>12810<br>12811<br>12812<br>12813 | <b>RALSTON PURINA CO.,</b><br>St. Louis, Mo.           |                                                           |
|                                                                                                                   | Protana Feed .....                                     | Rumble & Wensel Co., Natchez.....                         |
|                                                                                                                   | Protana Feed .....                                     | Capital Grocery Co., Jackson.....<br>Guarantee.....       |
|                                                                                                                   | Purina Feed .....                                      | Rumble & Wensel Co., Natchez.....                         |
|                                                                                                                   | Purina Feed .....                                      | The Goyer Co., Greenville.....                            |
|                                                                                                                   | Purina Feed .....                                      | Merchants Grocery Co., Hazlehurst...                      |
|                                                                                                                   | Purina Feed .....                                      | The Goyer Company, Greenville.....                        |
|                                                                                                                   | Purina Feed .....                                      | W. O. Worrell Company, Vicksburg...                       |
|                                                                                                                   | Purina Feed .....                                      | Hattiesburg Grocery Co., Hattiesburg...<br>Guarantee..... |
|                                                                                                                   | Poultry Feed .....                                     | Gulfport Grocery Co., Gulfport.....                       |
|                                                                                                                   | Poultry Feed .....                                     | Hattiesburg Grocery Co., Hattiesburg...                   |
|                                                                                                                   | Poultry Feed .....                                     | The Capital Grocery Co., Jackson.....                     |
|                                                                                                                   | Poultry Feed .....                                     | The Goyer Company, Greenville.....                        |
|                                                                                                                   | Poultry Feed .....                                     | Hattiesburg Grocery Co., Hattiesburg...<br>Guarantee..... |
| 12814                                                                                                             | <b>RANDOLPH MILLING CO.,</b><br>Baldwin, Ill.          |                                                           |
|                                                                                                                   | Pure Wheat Middlings .....                             | T. S. Cunningham, Aberdeen.....<br>Guarantee.....         |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12794              | 9.89               | 2.11          | 3.18<br>3.50        | 15.50<br>13.50          | 67.84<br>55.00          | 1.48<br>8.00          |
| 12795              | 9.17               | 6.15          | 4.49<br>3.50        | 15.75<br>10.00          | 56.91<br>54.50          | 7.53<br>12.00         |
| 12796              | 9.73               | 4.51          | 4.85<br>3.50        | 16.63<br>10.00          | 59.71<br>56.50          | 4.57<br>12.00         |
| 12797              | 9.58               | 7.12          | 4.46                | 16.94                   | 53.24                   | 8.66                  |
| 12798              | 10.10              | 6.45          | 4.03                | 16.38                   | 54.42                   | 8.62                  |
| 12799              | 9.54               | 6.91          | 4.48<br>4.00        | 16.88<br>16.00          | 53.42<br>54.00          | 8.77<br>9.00          |
| 12800              | 8.99               | 3.35          | 3.77<br>3.75        | 10.31<br>9.75           | 64.87<br>63.00          | 8.71<br>10.50         |
| 12801              | 9.42               | 5.56          | 4.79                | 12.13                   | 59.30                   | 8.80                  |
| 12802              | 9.79               | 4.70          | 3.87<br>3.80        | 11.31<br>12.00          | 61.94<br>58.00          | 8.39<br>8.90          |
| 12803              | 9.42               | 4.72          | 4.94                | 12.56                   | 59.97                   | 8.39                  |
| 12804              | 10.42              | 4.22          | 5.08                | 12.13                   | 60.44                   | 7.71                  |
| 12805              | 9.83               | 4.52          | 3.85                | 12.31                   | 60.17                   | 9.32                  |
| 12806              | 11.14              | 4.52          | 4.76                | 11.75                   | 59.01                   | 8.82                  |
| 12807              | 10.36              | 4.51          | 4.90                | 12.31                   | 59.49                   | 8.43                  |
| 12808              | 11.46              | 4.28          | 4.91<br>4.00        | 12.13<br>12.50          | 58.99<br>58.00          | 8.23<br>8.90          |
| 12809              | 10.84              | 1.67          | 3.43                | 10.75                   | 70.85                   | 2.46                  |
| 12810              | 11.17              | 1.66          | 3.51                | 11.06                   | 70.35                   | 2.25                  |
| 12811              | 11.18              | 1.73          | 3.62                | 10.88                   | 70.31                   | 2.28                  |
| 12812              | 10.88              | 1.84          | 3.62                | 11.13                   | 69.88                   | 2.65                  |
| 12813              | 11.68              | 1.63          | 3.60<br>3.60        | 10.94<br>11.00          | 69.40<br>65.00          | 2.75<br>4.00          |
| 12814              | 10.07              | 3.92          | 5.69<br>3.50        | 18.44<br>16.00          | 58.18<br>56.00          | 3.70<br>5.50          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                           | Where and from Whom Collected.                                   |
|--------------------|-----------------------------------------------------------|------------------------------------------------------------------|
|                    | <b>ST. MARY'S MILLING CO.,</b><br>St. Mary's, Mo.         |                                                                  |
| 12815              | Pure Wheat Middlings .....                                | B. F. Youngblood & Co., Wesson.....<br>Guarantee.....            |
|                    | <b>SAXONY MILLS,</b><br>St. Louis, Mo.                    |                                                                  |
| 12816              | Brown Wheat Middlings .....                               | R. H. Green & Bro., Jackson.....<br>Guarantee.....               |
|                    | <b>THE SCOTT COUNTY MILLING COMPANY,</b><br>Sikeston, Mo. |                                                                  |
| 12817              | Wheat Bran .....                                          | Sol Fried, Vicksburg.....<br>Guarantee.....                      |
| 12818              | Corn Chops.....                                           | E. Bonelli Co., Vicksburg.....<br>(No guarantee submitted)       |
|                    | <b>STANARD TILTON MILLING CO.</b><br>St. Louis, Mo.       |                                                                  |
| 12819              | Wheat Bran .....                                          | The Goyer Co., Greenville.....<br>Guarantee.....                 |
| 12820              | Wheat Middlings.....                                      | The Goyer Co., Greenville .....                                  |
|                    | <b>TAYLOR-GREER GRAIN CO.,</b><br>Memphis, Tenn.          |                                                                  |
| 12821              | Pure Wheat Bran .....                                     | Hattiesburg Grocery Co., Hattiesburg<br>(No guarantee submitted) |
| 12822              | Pure Wheat Middlings .....                                | Hattiesburg Grocery Co., Hattiesburg<br>(No guarantee submitted) |
|                    | <b>TENNESSEE FIBRE COMPANY,</b><br>Memphis, Tenn.         |                                                                  |
| 12937              | Cremo Brand Feed Meal<br>(Cow and Ox Feed) .....          | Union Naval Stores, Gulfport.....<br>Guarantee.....              |
|                    | <b>THREEFOOT BROS. &amp; CO.,</b><br>Meridian, Miss.      |                                                                  |
| 12823              | Rice Polish .....                                         | Threefoot Bros. & Co., Meridian.....<br>Guarantee.....           |
|                    | <b>JAC. TROUTMAN,</b><br>New Orleans, La.                 |                                                                  |
| 12824              | Rice Bran .....                                           | Threefoot Bros. & Co., Meridian.....<br>(No guarantee submitted) |
| 12825              | Rice Polish .....                                         | Gulfport Grocery Co., Gulfport.....<br>Guarantee .....           |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12815              | 10.53              | 3.55          | 4.70<br>4.20        | 16.56<br>15.81          | 61.59<br>62.37          | 3.07<br>2.90          |
| 12816              | 10.24              | 5.07          | 5.45<br>4.00        | 17.31<br>15.00          | 56.88<br>55.00          | 5.05<br>8.00          |
| 12817              | 8.50               | 6.26          | 4.63<br>4.00        | 16.44<br>14.15          | 55.87<br>55.00          | 8.30<br>9.00          |
| 12818              | 10.47              | 1.50          | 4.23                | 9.75                    | 72.48                   | 1.57                  |
| 12819              | 10.60              | 6.85          | 4.68<br>3.50        | 18.69<br>14.00          | 51.36<br>54.00          | 7.82<br>10.00         |
| 12820              | 11.14              | 4.29          | 4.64<br>5.00        | 18.13<br>16.00          | 56.79<br>40.00          | 5.01<br>7.00          |
| 12821              | 9.77               | 6.05          | 4.55                | 18.50                   | 54.17                   | 6.96                  |
| 12822              | 10.61              | 4.35          | 5.10                | 18.63                   | 55.66                   | 5.65                  |
| 12937              | 6.23               | 4.33          | 5.02<br>5.00        | 21.81<br>20.00          | 41.39<br>36.00          | 21.22<br>25.00        |
| 12823              | 9.27               | 4.75          | 10.19<br>10.00      | 11.44<br>10.50          | 62.80<br>56.00          | 1.55<br>2.00          |
| 12824              | 8.96               | 9.89          | 3.99                | 10.00                   | 55.16                   | 12.00                 |
| 12825              | 9.80               | 4.45          | 7.75<br>6.25        | 10.19<br>9.62           | 64.77<br>69.22          | 3.04<br>1.20          |

TABLE I.—Analyses of Commercial Feeding Stuffs

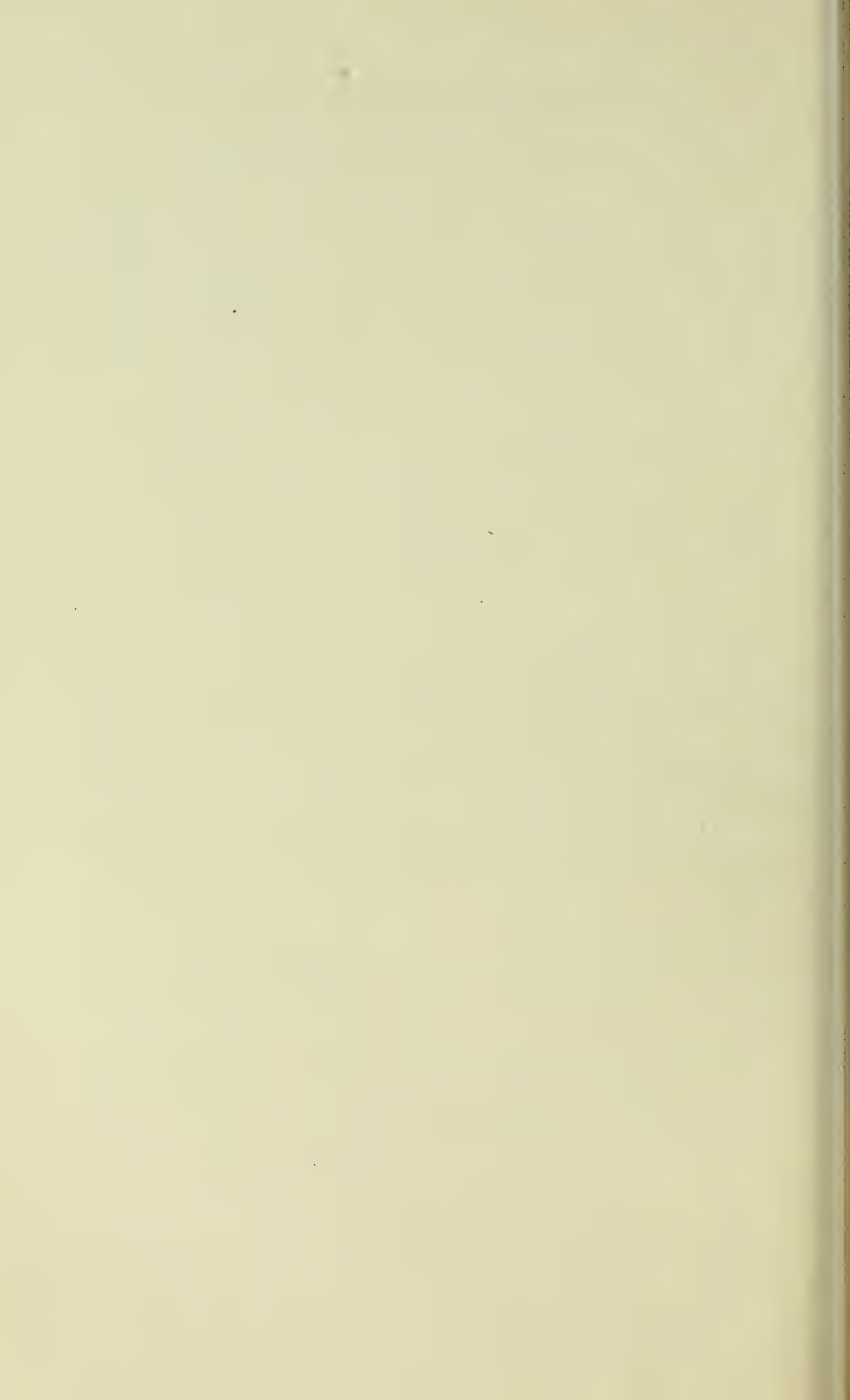
| Laboratory Number. | Name of Brand and Manufacturer.                      | Where and from Whom Collected.                                  |
|--------------------|------------------------------------------------------|-----------------------------------------------------------------|
|                    | <b>UNITED PRODUCE CO.,<br/>Mobile, Ala.</b>          |                                                                 |
| 12826              | Corn Chops.....                                      | M. L. McRae & Co., Leakesville.....<br>(No guarantee submitted) |
|                    | <b>THE VALLEY MILLING CO.,<br/>St. Louis, Mo.</b>    |                                                                 |
| 12827              | Acme Hen Feed.....                                   | I. Lowenberg & Co., Natchez.....<br>Guarantee.....              |
| *12828             | Delta Feed .....                                     | I. Lowenberg & Co., Natchez.....<br>Guarantee.....              |
|                    | <b>JOHN WADE &amp; SONS,<br/>Memphis, Tenn.</b>      |                                                                 |
| 12829              | Pure Wheat Bran .....                                | Roane & Co., Grenada .....                                      |
|                    |                                                      | Guarantee.....                                                  |
| 12830              | Corn Chops.....                                      | Roane & Co., Grenada.....                                       |
| 12831              | Corn Chops.....                                      | Davis & Chandler, West Point.....                               |
| 12832              | Corn Chops.....                                      | Tom Lyle Grocery Co., Meridian.....                             |
| 12833              | Chops .....                                          | D. W. Wilkinson & Bro., Jackson.....                            |
| 12834              | Chops .....                                          | D. G. Patton & Co., Jackson.....<br>(No guarantee submitted)    |
| 12835              | Purity Feed .....                                    | McMahon Grocery Co., Greenville.....<br>Guarantee.....          |
| 12836              | Pure Wheat Shorts .....                              | Butler & Fife, New Albany.....<br>Guarantee.....                |
|                    | <b>WASHBURN - CROSBY CO.,<br/>Minneapolis, Minn.</b> |                                                                 |
| 12837              | Standard Middlings.....                              | G. Lowenburg & Co., Kosciusko.....                              |
| 12838              | Standard Middlings.....                              | Greenwood Grocery Co., Greenwood.....<br>Guarantee.....         |
|                    | <b>WEBB &amp; MAURY,<br/>Memphis, Tenn.</b>          |                                                                 |
| 12839              | Corn Chops.....                                      | Hattiesburg Grocery Co., Hattiesburg.....                       |
| 12840              | Corn Chops.....                                      | Hattiesburg Grocery Co., Hattiesburg.....                       |
| 12841              | Corn Chops.....                                      | A. J. Lyons & Co., Meridian.....<br>(No guarantee submitted)    |
| 12842              | Pure Wheat Shorts .....                              | Clay County Cot. Oil Co., West Point.....<br>Guarantee.....     |
|                    | <b>YATES &amp; DONELSON CO.,<br/>Memphis, Tenn.</b>  |                                                                 |
| 12843              | Wheat Bran .....                                     | R. H. Green & Bro., Jackson.....<br>Guarantee.....              |

\* Analysis No. 10800 of Delta Feed published in bulletin No. 133, page 131, shows the sample to contain 1.69% of fat. After investigation, the Department is convinced that this analysis may be withdrawn without injustice. No sample of this brand has been found since, which contains a lower percentage of fat than given for No. 12828 above, and it is believed that Analysis No. 10800 does not fairly represent this shipment of Delta Feed.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 12826              | 11.50              | 2.41          | 4.66                | 8.44                    | 70.59                   | 2.40                  |
| 12827              | 11.41              | 1.98          | 3.48<br><i>4.00</i> | 10.00<br><i>9.50</i>    | 70.77<br><i>55.00</i>   | 2.36<br><i>12.00</i>  |
| 12828              | 9.06               | 3.47          | 4.56<br><i>5.00</i> | 8.31<br><i>8.50</i>     | 65.80<br><i>50.00</i>   | 8.80<br><i>12.00</i>  |
| 12829              | 9.82               | 6.03          | 4.70<br><i>3.50</i> | 16.06<br><i>10.00</i>   | 56.02<br><i>50.00</i>   | 7.37<br><i>12.00</i>  |
| 12830              | 11.58              | 1.35          | 4.43                | 8.38                    | 71.74                   | 2.52                  |
| 12831              | 11.84              | 1.30          | 4.19                | 9.13                    | 72.07                   | 1.47                  |
| 12832              | 11.24              | 1.27          | 4.56                | 9.06                    | 71.88                   | 1.99                  |
| 12833              | 14.68              | 1.78          | 4.85                | 7.69                    | 69.39                   | 1.61                  |
| 12834              | 12.97              | 1.34          | 4.49                | 7.63                    | 71.61                   | 1.96                  |
| 12835              | 11.50              | 2.96          | 4.29<br><i>4.25</i> | 8.00<br><i>9.25</i>     | 67.95<br><i>65.00</i>   | 5.30<br><i>5.50</i>   |
| 12836              | 10.48              | 4.64          | 5.97<br><i>3.50</i> | 17.75<br><i>10.00</i>   | 56.39<br><i>50.00</i>   | 4.77<br><i>12.00</i>  |
| 12837              | 10.33              | 4.94          | 6.03                | 17.94                   | 53.31                   | 7.45                  |
| 12838              | 10.48              | 4.44          | 6.23<br><i>4.00</i> | 18.94<br><i>15.00</i>   | 53.24<br><i>55.00</i>   | 6.67<br><i>8.00</i>   |
| 12839              | 15.26              | 1.14          | 3.57                | 7.69                    | 70.95                   | 1.39                  |
| 12840              | 13.54              | 1.44          | 4.50                | 8.38                    | 70.79                   | 1.35                  |
| 12841              | 12.28              | 1.47          | 4.17                | 9.38                    | 65.40                   | 7.30                  |
| 12842              | 10.31              | 4.56          | 5.98<br><i>3.50</i> | 19.25<br><i>10.00</i>   | 53.53<br><i>50.00</i>   | 6.37<br><i>12.00</i>  |
| 12843              | 11.00              | 5.73          | 4.43<br><i>3.58</i> | 15.81<br><i>14.85</i>   | 57.21<br><i>54.60</i>   | 5.82<br><i>10.00</i>  |





# Mississippi Agricultural Experiment Station.

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BULLETIN No. 138.
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## INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS

ON SALE IN THE STATE



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI

MAY, 1910.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



Inspection and Analyses of Feeding Stuffs

BY THE CHEMICAL DEPARTMENT OF THE

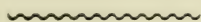
Mississippi Agricultural and Mechanical College.



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INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS.

Season 1909-1910.



Introduction.—This bulletin contains analyses of 265 samples of feed. All of these samples were drawn in the same manner by regular inspectors. Inspectors are on the road constantly, and an active inspection will be maintained throughout the season.

Results of the inspection.—These analyses of samples drawn from shipments in the possession of dealers are sufficient to demonstrate that shippers generally have supplied the trade with feeds conforming with the guaranties made for them. Very few material deficiencies may be found in the table giving the results.

Omitting the corn chops, fourteen samples are deficient in the sum of the fat and protein guaranteed. Many of these deficiencies, however, are slight, since the table contains only one sample deficient in the sum of fat and protein to the extent of 5% of that guaranteed.

In some cases, however, manufacturers are apparently maintaining a rather small margin between their guaranties and actual composition. It is impracticable, of course, to secure products of invariable composition, or to prepare from them an entirely homogeneous mixture.

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	AKIN-ERSKINE MILLING CO., Evansville, Ind.	
13103	Wheat Shorts	Donaghue & Dee, Columbus
13104	Wheat Shorts	Hood Milling Co., Gulfport
13105	Wheat Shorts	Winona Merc. Co., Winona
		Guarantee
	ALABAMA CORN MILLS CO., Mobile, Ala.	
13106	Wheat Bran	Lucedale Commercial Co., Lucedale
		Guarantee
13107	Wheat Shorts	Lucedale Commercial Co., Lucedale
		Guarantee
13108	Cracked Corn	Lucedale Commercial Co., Lucedale
	AMERICAN MILLING COMPANY, Owensboro, Ky.	
13614	Sucrene Alfalfa Horse & Mule Feed	D. W. Wilkinson & Bro., Jackson
13615	Sucrene Alfalfa Horse & Mule Feed	Yazoo Grocery Co., Yazoo City
13616	Sucrene Dairy Feed	D. Jean Mitchell Co., Scranton
		Guarantee
13109	Sucrene Horse & Mule Feed ..	C. J. Edwards Co., Vicksburg
13617	Sucrene Horse & Mule Feed ..	Yazoo Grocery Co., Yazoo City
13618	Sucrene Horse & Mule Feed ..	A. M. Levy & Co., Belzonia
13619	Sucrene Horse & Mule Feed ..	P. P. Williams & Co. Vicksburg
13620	Sucrene Horse & Mule Feed ..	Capitol Grocery Co., Jackson
		Guarantee
13621	Sucrene Stock Feed	P. P. Williams Co., Vicksburg
		Guarantee
	ARKADELPHIA MILLING CO., Arkadelphia, Ark.	
13110	Wheat Bran	E. F. Elkin, Meridian
		Guarantee
13111	Wheat Shorts	Winner Klein & Co., Meridian
13112	Wheat Shorts	E. F. Elkin, Meridian
		Guarantee
	ARLINGTON ROLLER MILLS, Arlington, Ky.	
13113	Bran	Brennen & McCharen, Oxford
		Guarantee

Collected by State Chemist, Season 1909-1910.

laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13103	9.21	4.70	5.34	18.06	57.56	5.13
13104	10.91	4.29	5.20	17.44	57.09	5.07
13105	8.93	4.09	5.58	18.13	58.37	4.90
			4.50	16.36	62.66	3.90
13106	8.96	6.51	5.37	16.06	55.22	7.88
			4.00	14.50	50.00	9.50
13107	10.24	4.72	6.13	19.13	54.94	4.84
			4.00	16.00	48.00	6.42
13108	13.04	1.52	4.61	8.06	64.59	8.18
13614	9.99	4.51	3.73	11.00	60.23	10.54
13615	8.20	4.78	4.09	11.19	60.01	11.73
			3.50	10.00	50.00	12.00
13616	8.96	8.68	5.87	19.13	46.69	10.67
			3.50	16.50	46.00	12.00
13109	10.97	6.60	3.52	9.38	61.47	8.06
13617	10.33	6.89	4.00	8.88	61.28	8.62
13618	9.34	6.45	3.81	8.38	62.56	9.46
13619	9.64	7.13	4.95	9.44	60.12	8.72
13620	11.12	5.96	4.28	9.19	62.20	7.25
			3.50	10.00	50.00	12.00
13621	10.08	3.80	3.74	10.00	64.92	7.46
			3.50	10.00	50.00	12.00
13110	8.56	9.46	4.62	12.94	50.20	14.22
			3.50	12.00	50.00	12.00
13111	10.43	7.85	4.62	15.00	52.35	9.75
13112	9.16	4.82	5.48	20.50	55.52	4.52
			3.50	12.00	50.00	12.00
13113	8.21	6.67	5.01	15.44	56.67	8.00
			4.00	14.00	52.00	9.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	AURORA MILLING COMPANY, Aurora, Mo.	
13114	Aurora Mixed Feed.....	W. H. Pritchard & Co., Natchez Guarantee.....
	BALLARD & BALLARD COMPANY Louisville, Ky.	
13115	Ballard's Wheat Bran	W. L. Watkins & Co., Aberdeen..... Guarantee.....
13116	Ballard's Shipstuff	Capital Grocery Co., Jackson.....
13117	Ballard's Shipstuff	W. L. Watkins & Co., Aberdeen..... Guarantee.....
	C. BECKER MILLING COMPANY, Red Bud, Ill.	
13118	Wheat Bran	Clay County Cot. Oil Co., West Point
13119	Wheat Bran	W. S. Keyes, West Point.....
13120	Wheat Bran	Gulfport Grocery Co., Gulfport..... Guarantee.....
13121	Wheat Shorts.....	Davis & Chandler Co., West Point .. Guarantee.....
	BILOXI MILLING COMPANY, Biloxi, Miss.	
13122	B. M. C. Cow Feed	Biloxi Milling Co., Biloxi..... Guarantee.....
13123	B. M. C. Horse Feed.....	Biloxi Milling Co., Biloxi..... Guarantee.....
	BLODGETT GRAIN & ELEVATOR COMPANY, Blodgett, Mo.	
13124	Corn Chops.....	Tom Lyle Grocery Co., Meridian.....
	BROWDER MILLING COMPANY, Fulton, Ky.	
13125	Mixed Feed	P. H. Anderson & Co., Holly Springs
13126	Mixed Feed	F. S. Leavell, Oxford..... Guarantee.....
	E. C. BUCHANAN & COMPANY, Memphis, Tenn.	
13145	Chops	Queen City Feed Co., Meridian.....
13127	Andes Mixed Feed	J. R. Buchanan, Sardis..... Guarantee.....
13128	Bran and Shipstuff	J. R. Buchanan, Sardis..... Guarantee*

*No guarantee submitted.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13114	10.69	5.28	5.02 3.50	16.69 16.00	55.95 53.00	6.37 10.00
13115	9.05	6.46	4.87 4.10	15.75 14.44	56.10 50.00	7.77 9.00
13116	9.35	4.19	4.50	15.94	61.52	4.50
13117	9.89	4.11	4.16 3.75	15.44 15.69	61.67 55.00	4.73 6.87
13118	8.83	7.09	4.52	15.56	55.93	8.07
13119	8.07	6.31	4.34	15.75	57.11	8.42
13120	8.02	6.92	4.23 3.58	15.94 14.50	60.42 52.00	4.47 10.00
13121	9.69	4.30	5.47 4.20	18.00 15.50	57.57 60.30	4.97 3.70
13122	9.37	3.40	4.61 5.00	12.19 10.00	66.43 62.55	4.00 10.00
13123	7.60	2.12	4.76 4.00	10.19 9.50	71.29 70.58	4.04 5.00
13124	10.27	1.40	4.67	8.19	73.72	1.75
13125	8.48	5.43	5.60	16.94	57.69	5.86
13126	6.24	6.16	5.91 4.25	17.38 15.00	57.79 54.00	6.52 9.00
13145	6.26	1.74	5.30	9.25	75.88	1.57
13127	12.41	2.86	4.55 4.00	11.25 12.18	66.15 62.71	2.78 5.73
13128	9.43	5.62	4.99	16.75	56.97	6.24

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	T. H. BUNCH COMPANY, Little Rock, Ark.	
13848	Corn Chops.....	A. J. Lyons & Co., Meridian.....
	CAIN MILL COMPANY, Atchison, Kansas.	
13129	Cain's Shorts	J. R. Buchanan, Sardis..... Guarantee
	CAIRO MILLING COMPANY, Cairo, Ill.	
13130	Purity Bran	Sledge & Wesson, Como.....
13131	Purity Bran	Union Naval Stores Gulfport..... Guarantee.....
	CAPITAL GRAIN & MILL CO., Nashville, Tenn.	
13427	Alfacorn Feed	Merchants Grocery Co., Hattiesburg* Guarantee
13132	Mixed Capital Chops	Threefoot Bros. & Co., Meridian..... Guarantee
	CLEVELAND BROS. Mobile, Ala.	
13133	Wheat Shorts.....	D. Jean Mitchell, Scranton..... Guarantee.....
	COLUMBIA STAR MILLING CO., Columbia, Ill.	
13134	Wheat Bran	Hood Milling Co., Gulfport..... Guarantee
	CORNO MILLS COMPANY, St. Louis, Mo.	
13135	Corno Hen Feed	The Barrett Grocery Co., Lexington.....
13136	Corno Hen Feed	Greenwood Grocery Co., Greenwood* Guarantee
13137	Corno Horse & Mule Feed	Yazoo Grocery Co., Yazoo City.....
13138	Corno Horse & Mule Feed	A. J. Lyons & Co., Meridian.....
13139	Corno Horse & Mule Feed	A. J. Lyons & Co., Meridian.....
13140	Corno Horse & Mule Feed	The Barrett Grocery Co., Lexington.....
13141	Corno Horse & Mule Feed	J. L. Walker & Co., Columbus.....
13142	Corno Horse & Mule Feed	A. J. Lyons & Co., Meridian.....
13143	Corno Horse & Mule Feed	Johnson-Hand Co., Ellisville..... Guarantee

* Found below guarantee and shipped outside of state.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13848	11.64	1.26	5.05	8.06	71.89	2.10
13129	10.93	4.23	4.56 4.00	18.38 15.00	57.74 55.00	4.16 7.00
13130	9.22	6.95	4.28	15.56	55.66	8.33
13131	9.16	6.70	4.39 4.00	16.81 13.40	55.51 54.00	7.43 10.30
13427	10.25	6.19	2.45 3.50	11.50 10.00	59.37 54.00	10.24 12.00
13132	9.91	2.46	4.41 4.50	8.94 9.00	71.62 62.00	2.66 10.00
13133	10.48	4.57	6.17 3.50	17.88 12.00	56.61 50.00	4.29 10.50
13134	9.09	6.22	5.43 3.74	17.06 15.26	55.17 53.38	7.03 9.21
13135	8.77	1.81	4.06	12.00	71.54	1.82
13136	10.15	1.56	4.14 3.70	11.13 10.00	71.24 70.00	1.78 2.30
13137	6.23	4.38	3.89	12.06	63.29	10.15
13138	6.95	4.17	4.42	11.75	62.84	9.87
13139	6.52	4.32	4.82	12.75	62.59	9.00
13140	8.78	3.97	3.55	11.63	64.00	8.07
13141	7.83	4.89	3.57	11.31	71.12	1.28
13142	7.20	3.50	4.42	10.19	66.85	7.84
13143	6.91	4.41	4.15 3.50	12.50 10.00	63.78 58.50	8.25 12.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	CUNNINGHAM COMMISSION CO., Little Rock, Ark.	
13144	Pulaski Mixed Feed	Queen City Feed Co., Meridian.....
		Guarantee.....
13146	Chops	Harris & Co., Meridian.....
	DAHNIKE-WALKER MILLING CO., Union City, Tenn.	
13147	Chops	W. S. Keyes, West Point.....
13148	Wheat Shorts.....	New Albany Wholesale Grocery Co., New Albany.....
13149	Wheat Shorts.....	W. E. Laird, Hattiesburg.....
13150	Wheat Shorts.....	T. J. Lyle, Okolona.....
		Guarantee
	DROGE BROS. ELEVATOR, Council Bluffs, Iowa.	
13151	Corn Chops.....	Winner Klein & Co., Meridian.....
13152	Corn Chops.....	Meyer Bros., Meridian.....
13153	Corn Chops.....	Meyer Bros., Meridian.....
	J. B. EDGAR GRAIN COMPANY, Memphis, Tenn.	
13154	Ceralfa Stock Feed	J. C. McClinton, Newton.....
13155	Ceralfa Stock Feed	R. L. Crook & Co., Vicksburg
13156	Ceralfa Stock Feed	Planters Supply Co., Greenwood.....
13157	Ceralfa Stock Feed	Crawford Grocery Co., Greenville.....
13158	Ceralfa Stock Feed	Yazoo Grocery Co., Yazoo City.....
		Guarantee
	EDWARDSVILLE MILLING CO., Edwardsville, Ill.	
13159	Wheat Bran	Clark & Tyler, Holly Springs.....
		Guarantee.....
	FREEBURG MILLING COMPANY, Freeburg, Ill.	
13160	Wheat Bran	Foote Patrick Co., Laurel.....
		Guarantee
13161	Wheat Middlings.....	Foote-Patrick Co., Laurel
		Guarantee

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13144	8.21	6.88	7.34 4.00	14.19 12.00	53.11 55.00	10.27 12.00
13146	9.96	1.45	4.60	9.50	73.02	1.47
13147	7.27	1.47	4.23	8.75	77.11	1.17
13148	9.38	5.12	5.48	15.56	59.71	4.75
13149	8.08	4.71	5.67	14.25	62.00	5.29
13150	9.74	3.86	6.00 4.85	16.94 13.75	58.04 62.00	5.42 7.50
13151	8.48	1.53	5.12	9.63	73.37	1.87
13152	8.91	1.45	4.85	9.13	73.98	1.68
13153	8.28	1.33	4.29	9.00	75.68	1.42
13154	7.90	5.91	4.17	12.50	61.97	7.55
13155	7.74	5.78	4.20	13.69	60.80	7.79
13156	9.11	5.74	3.79	12.13	61.27	7.96
13157	8.44	6.56	4.21	12.75	59.06	8.98
13158	5.15	6.10	4.71 4.00	13.44 13.00	61.97 55.00	8.63 11.50
13159	4.86	6.89	4.79 3.50	15.25 14.00	59.27 54.00	8.94 9.05
13160	8.73	6.30	4.53 3.50	16.63 14.00	56.28 54.00	7.53 9.50
13161	11.70	3.95	4.30 3.50	16.38 13.50	61.28 55.00	2.39 5.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13162	FORKED DEER MILLING CO., Dyersburg, Tenn. Bran	C. M. Elder, New Albany..... Guarantee.....
13163	B. F. GLOVER & SON COMMIS- SION COMPANY, New Orleans, La. Wheat Bran	The Tate Co., Laurel..... R. Renicke, Scranton..... Guarantee.....
13164	Wheat Bran	Dunagin-Whittaker Co., Laurel.....
13165	Wheat Shorts.....	R. Renicke, Scranton.....
13166	Wheat Shorts.....	Guarantee.....
13167	Chops	De Jean Mitchell, Scranton.....
13168	Chops	Dunnagin-Whittaker Co., Laurel.....
13169	GREAT WESTERN CEREAL CO., Chicago, Ill. Boss Feed	Southern Com. Co., Greenville.....
13170	Boss Feed	Hyman Grocery Co., Greenwood.....
13531	Boss Feed.....	New Albany Wholesale Grocery Co., New Albany.....
13532	Boss Feed.....	Craig Bros., New Albany.....
13533	Boss Feed.....	Yazoo Grocery Co., Yazoo City
13534	Boss Feed.....	Southern Com. Co., Greenville.....
13535	Boss Feed.....	Greenwood Grocery Co., Greenwood.....
13536	Boss Feed.....	R. L. Crook & Co., Vicksburg.....
13537	Boss Feed.....	Taylor-Wills Grocery Co., Jackson... Guarantee.....
13172	Durham Feed	I. Lowenberg & Co., Natchez.....
13538	Durham Feed	I. Lowenberg & Co., Natchez..... Guarantee.....
13173	Excelsior Feed	R. L. Crook & Co., Vicksburg.....
13539	Excelsior Feed.....	Merchants Grocery Co., Brookhaven.....
13540	Excelsior Feed.....	R. L. Crook & Co., Vicksburg.....
13541	Excelsior Feed.....	R. H. Green & Bro., Jackson..... Guarantee.....
13174	Grainfalfa	Hyman Grocery Co., Greenwood.....
13175	Grainfalfa	Grenada Grocery Co., Grenada.....
13542	Grainfalfa	New Albany Wholesale Grocery Co., New Albany.....
13543	Grainfalfa	Merchants Grocery Co., Brookhaven... Guarantee.....
13544	Maizefalfa	Greenwood Grocery Co., Greenwood.....
13545	Maizefalfa	R. H. Green & Bro., Jackson..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13162	8.05	5.43	4.45 3.79	16.50 15.47	59.22 58.86	6.35 7.27
13163	8.61	5.18	4.71	16.94	57.91	6.65
13164	8.06	7.48	4.74 3.58	15.81 14.85	53.51 54.60	10.40 10.00
13165	8.63	5.19	5.71	17.38	55.93	7.16
13166	10.51	4.70	5.32 4.50	17.44 14.90	57.23 56.80	4.80 7.40
13167	7.46	1.66	4.79	8.25	76.62	1.22
13168	11.54	1.32	4.25	8.13	73.28	1.48
13169	6.80	3.07	5.87	12.25	66.89	5.12
13170	7.12	3.20	5.63	11.06	66.99	6.00
13531	8.47	3.54	5.74	11.25	65.94	5.06
13532	9.79	3.46	6.11	11.25	65.91	3.48
13533	11.62	4.98	5.12	11.06	62.91	4.31
13534	9.51	4.18	5.09	12.13	63.19	5.90
13535	9.17	3.26	4.57	11.31	65.67	6.02
13536	10.42	3.48	5.81	13.19	61.48	5.62
13537	8.69	3.74	4.39 4.00	12.25 9.50	64.62 60.00	6.31 10.00
13172	7.72	3.11	5.69	11.75	65.84	5.89
13538	9.70	3.50	5.76 4.00	11.63 9.50	63.34 60.00	6.07 10.00
13173	5.79	3.95	4.81	10.56	67.46	7.43
13539	9.32	3.33	5.24	11.13	64.98	6.00
13540	10.32	3.45	5.68	12.75	62.70	5.10
13541	9.45	5.63	4.72 4.00	10.88 9.50	62.90 60.00	6.42 10.00
13174	6.44	4.88	4.33	12.31	63.39	8.65
13175	8.02	4.04	4.35	11.50	65.29	6.80
13542	9.26	4.74	4.64	11.00	63.71	6.65
13543	10.09	5.77	5.37 4.00	11.38 10.00	61.10 60.00	6.29 11.00
13544	9.06	3.93	4.06	10.94	65.42	6.59
13545	11.16	6.30	4.93 4.00	11.69 10.00	60.80 60.00	5.12 11.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13546	*Sterling Chick Feed.....	Taylor-Wills Grocery Co., Jackson Guarantee.....
13176	Sterling Scratch Feed	Gulfport Grocery Co., Gulfport.....
13547	Sterling Scratch Feed.....	R. L. Crook & Co., Vicksburg..... Guarantee.....
	GREAT WESTERN FEED CO., St. Louis, Mo.	
13177	Purity Horse & Cattle Feed ..	W. F. Funchess, Osyka..... Guarantee.....
	GULFPORT GROCERY CO., Gulfport, Miss.	
13178	Big Bucket Cow Feed	Biloxi Milling Co., Biloxi.....
13681	Big Bucket Cow Feed	Gulfport Grocery Co., Gulfport..... Guarantee.....
13682	Mile Post Feed	Gulfport Grocery Co., Gulfport.....
13179	Mile Post Feed	Gulfport Grocery Co., Gulfport.....
13683	Mile Post Feed	Nelson-Gray Co., Magee.....
13180	Mile Post Feed	R. Renicke, Seranton.....
13684	Mile Post Feed	Kennedy & Co., Wiggins.....
13181	Mile Post Feed	Biloxi Milling Co., Biloxi..... Guarantee.....
13685	Nek Yok Ox Feed.....	Kennedy & Co., Wiggins.....
13182	Nek Yok Ox Feed.....	Ovett Merc. Co., Ovett.....
13686	Nek Yok Ox Feed.....	Gulfport Grocery Co., Gulfport.....
13687	Nek Yok Ox Feed.....	Kennedy & Co., Wiggins..... Guarantee.....
	H. L. HALLIDAY MILLING CO., Cairo, Ill.	
13183	Wheat Bran	R. H. Green & Bro., Jackson.....
13184	Wheat Bran	Gulfport Grocery Co., Gulfport..... Guarantee.....
	HANNAH DISTRIBUTING CO., Jackson, Miss.	
13185	Wheat Bran	Fernwood Lumber Co., Fernwood.....
13186	Wheat Bran	Hannah Distributing Co., Jackson.... Guarantee.....
13187	Wheat Shorts.....	Hannah Distributing Co., Jackson....
	HANOVER STAR MILLING CO., Germantown, Ill.	
13188	Middlings	Parker Bros., Sandersville
		Guarantee.....

*NOTE:—Sample 13546 is more than 10% below guarantee in fat.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13546	9.36	1.29	2.74 3.50	10.88 10.00	74.40 65.00	1.33 4.00
13176	10.52	2.54	3.56	10.44	70.67	2.27
13547	10.35	1.61	3.78 3.50	9.63 10.00	73.08 65.00	1.55 4.00
13177	8.33	4.91	4.25 4.00	13.25 11.50	56.94 55.00	12.32 10.00
13178	9.39	5.32	4.07	19.94	47.88	13.40
13681	8.66	5.48	4.92 3.50	20.19 10.00	43.45 45.00	17.30 25.00
13682	10.96	5.83	3.37	13.19	57.20	9.45
13179	8.00	4.10	3.89	11.88	63.30	8.83
13683	10.00	5.51	3.87	12.75	59.60	8.27
13180	7.94	4.69	3.56	12.31	62.12	9.38
13684	8.48	4.74	3.71	13.00	61.87	8.20
13181	8.68	4.25	3.54 3.50	12.38 10.00	62.11 57.50	9.04 12.00
13685	7.93	3.35	3.68	14.44	52.40	18.20
13182	6.32	4.33	3.87	15.88	50.52	19.08
13686	8.39	3.75	3.62	13.19	51.50	19.55
13687	5.33	3.62	3.18 3.50	11.50 10.00	53.51 40.00	22.86 25.00
13183	9.34	7.11	4.23	15.94	56.66	6.72
13184	9.31	5.30	4.28 4.00	16.00 14.00	58.41 55.00	6.70 8.50
13185	8.97	6.40	4.66	16.38	56.88	6.71
13186	9.57	5.72	4.34 3.50	15.94 10.00	57.55 50.00	6.88 12.00
13187	10.35	4.55	5.36	17.94	57.76	4.04
13188	11.05	2.99	4.52 4.25	16.19 14.60	62.69 60.05	2.56 10.42

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	HARTFIELD & COOK, Memphis, Tenn	
13189	Wheat Bran	G. A. Wilson, Jr., Greenwood..... Guarantee.....
	J. B. HORTON & COMPANY, Memphis, Tenn.	
13190	Chops	T. S. Cunningham, Aberdeen.....
13191	Chops	Queen City Feed Co., Meridian.....
13849	Chops	J. B. Hughes, Stallo.....
	HUNTER BROS. MILLING CO., St. Louis, Mo.	
13192	Wheat Bran	Tom Lyle Grocery Co., Meridian.....
13193	Wheat Bran	Postlethwaite & Stewart Co., Natchez Guarantee.....
13194	Wheat Middlings	Myer Bros., Meridian.....
13195	Wheat Middlings	McInnis & Sturgis, Meridian.....
13196	Wheat Middlings	Phillips Merc. Co., Shubuta..... Guarantee.....
	ILLINOIS FEED MILLS, St. Louis, Mo.	
13197	Star Feed	G. A. Wilson, Jr., Greenwood..... Guarantee.....
	INTERSTATE MILLING CO., Memphis, Tenn.	
13198	*Sugaration Stock Feed	Clark Grocery Co., Tupelo.....
13199	Sugaration Stock Feed	The Goyer Co., Greenville
		Guarantee.....
	KEMPER MILL & ELEVATOR CO. Kansas City, Mo.	
13200	Shorts	Winner Klein & Co., Meridian.....
13201	Shorts	Myer Bros., Meridian.....
13202	Shorts	Tom Lyle Grocery Co., Meridian.....
13203	Shorts	Queen City Feed Co., Meridian..... Guarantee.....

* NOTE:—Sample 13198 is more than 10% below guarantee in fat.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13189	9.18	7.45	4.29 <i>3.57</i>	16.06 <i>14.80</i>	53.98 <i>54.60</i>	9.04 <i>10.00</i>
13190	13.98	1.40	3.13	7.75	72.59	1.15
13191	12.24	2.53	5.50	9.19	68.91	1.63
13849	9.50	1.17	3.61	8.31	76.23	1.18
13192	8.90	8.02	4.38	16.81	53.63	8.26
13193	10.89	5.82	4.24 <i>3.50</i>	18.81 <i>14.00</i>	53.26 <i>54.00</i>	6.98 <i>10.00</i>
13194	9.93	4.82	5.29	19.56	55.98	4.42
13195	11.14	4.19	5.01	16.13	58.59	4.94
13196	10.83	4.78	4.63 <i>4.00</i>	16.44 <i>16.00</i>	57.86 <i>56.00</i>	5.46 <i>9.00</i>
13197	6.97	3.95	3.89 <i>3.80</i>	12.06 <i>12.00</i>	65.21 <i>58.00</i>	7.92 <i>8.90</i>
13198	3.87	5.17	2.99	11.50	67.41	9.06
13199	6.54	4.44	3.92 <i>3.60</i>	12.56 <i>11.65</i>	65.32 <i>64.40</i>	7.22 <i>11.40</i>
13200	9.71	4.33	6.19	19.25	56.80	3.72
13201	7.86	5.13	5.79	19.94	57.28	4.00
13202	9.15	4.56	5.77	20.44	55.86	4.22
13203	9.06	4.90	5.90 <i>5.25</i>	20.31 <i>15.50</i>	55.41 <i>61.25</i>	4.42 <i>6.25</i>

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	HENRY A. KLYCE COMPANY, Dyersburg, Tenn.	
13204	Mixed Corn Chops.....	Reeves Grocery Co., Tupelo.....
13205	Mixed Corn Chops.....	Union Naval Stores, Gulfport.....
13206	Mixed Corn Chops.....	T. B. Cockrell, Itta Bena.....
13207	Mixed Corn Chops.....	A. J. Lyons & Co., Meridian.....
13850	Mixed Corn Chops.....	J. C. McClinton, Newton.....
13851	Mixed Corn Chops.....	Myer Bros., Meridian.....
13852	Mixed Corn Chops.....	Winner Klein & Co., Meridian.....
13853	Mixed Corn Chops.....	Queen City Feed Co., Meridian.....
13854	Mixed Corn Chops.....	Queen City Feed Co., Meridian..... Guarantee.....
	KORNFALFA FEED MILLING CO., Kansas City, Mo.	
13208	Kornfalfa Feed.....	J. D. Roberts & Co., Yazoo City..... Guarantee.....
	LAWRENCE & HAMILTON FEED COMPANY, New Orleans, La.	
13209	Stafolife.....	Foote-Patrick Co., Laurel.....
13210	Stafolife.....	W. E. Laird, Hattiesburg.....
13211	Stafolife.....	R. W. Hinton Co., Lumberton.....
13212	Stafolife.....	Gaddis-McLaurin Co., Raymond.....
13213	Stafolife.....	A. Beer & Co., Natchez.....
13214	Stafolife.....	W. M. Canty, Scranton.....
13215	Stafolife.....	Walton Bros. & Co., Newton.....
13216	Stafolife.....	E. F. Elkin, Meridian..... Guarantee.....
	LEAVENWORTH MILLING CO., Leavenworth, Kansas.	
13217	Wheat Middlings.....	C. M. Elder, New Albany.....
	LEXINGTON FLOUR MILLS, Lexington, Mo.	
13218	Wheat Shorts.....	McInnis & Sturgis, Meridian..... Guarantee.....
	LIBERTY MILLS, Nashville, Tenn.	
13219	Wheat Bran.....	Merchants Grocery Co., Hattiesburg.....
13220	Wheat Bran.....	Queen City Feed Co., Meridian.....
13221	Wheat Bran.....	Tom Lyle Grocery Co., Meridian.....
13222	Wheat Bran.....	Queen City Feed Co., Meridian.....
13223	Wheat Bran.....	Greenwood Grocery Co., Greenwood..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13204	11.37	1.45	4.09	8.50	71.97	2.62
13205	12.67	1.28	4.98	8.25	70.69	2.13
13206	12.53	1.32	4.23	8.75	70.61	2.56
13207	10.34	1.38	4.49	8.56	72.96	2.27
13850	9.91	1.37	4.38	7.75	74.14	2.45
13851	7.88	1.32	4.78	8.25	75.31	2.46
13852	8.04	1.46	5.01	8.75	73.92	2.82
13853	7.29	1.38	4.65	8.38	75.28	3.02
13854	7.40	1.39	5.14	8.19	75.74	2.14
			4.75	8.75	70.00	5.00
13208	11.26	10.95	3.16	11.19	56.06	7.38
			3.50	11.00	60.00	12.00
13209	7.37	2.32	5.77	12.13	59.05	13.36
13210	8.34	7.53	6.67	11.88	56.61	8.97
13211	8.37	9.15	5.77	11.38	54.43	10.90
13212	8.75	8.37	6.46	11.31	55.44	9.67
13213	8.46	7.72	6.87	11.50	57.85	7.60
13214	10.67	9.00	6.02	12.00	52.81	9.50
13215	7.13	9.48	6.35	10.88	56.08	10.08
13216	3.11	6.88	6.26	13.00	61.74	9.01
			6.00	11.00	53.00	12.00
13217	9.30	4.86	4.35	18.44	57.85	5.20
13218	12.09	3.96	5.43	17.13	57.39	4.00
			5.77	16.55	58.01	4.33
13219	7.40	7.02	4.49	17.69	54.90	8.50
13220	4.39	7.95	5.65	16.19	57.94	7.88
13221	4.28	6.00	4.96	15.56	61.15	8.05
13222	4.17	6.77	5.55	16.00	59.66	7.85
13223	5.55	6.48	5.79	15.81	58.71	7.66
			4.00	14.50	50.00	9.50

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13224	Wheat Shorts.....	J. L. Walker & Co., Columbus.....
13225	Wheat Shorts.....	Gibson Grocery Co., Ackerman.....
13226	Wheat Shorts.....	Merchants Grocery Co., Hattiesburg..
13227	Wheat Shorts.....	Queen City Feed Co., Meridian.....
13228	Wheat Shorts.....	Craig Bros., New Albany.....
13229	Wheat Shorts.....	The Walter Fisher Co., West Point....
13230	Wheat Shorts.....	R. H. Green & Bro., Jackson.....
13231	Wheat Shorts.....	Delta Grocery & Cot. Co., Clarksdale Guarantee.....
	LOUISIANA FEED PRODUCTS COMPANY, Baton Rouge, La.	
13232	Louisiana Horse Feed	Consumers Purchasing Co., Gulfport.... Guarantee.....
	GEO. B. MATTHEWS & SONS, New Orleans, La.	
13233	Rice Bran	Lampton Bros. Co., Tylertown..... Guarantee.....
13234	Rice Polish	W. F. Funchess & Co., Osyka..... Guarantee.....
	MEEK MILLING COMPANY, Marissa, Ill.	
13235	Wheat Bran and Ground Wheat Screenings	J. A. Williams, Maben..... Guarantee.....
13236	Wheat Shorts.....	Taylor Merc. Co., Como..... Guarantee.....
	MILLSTADT MILLING COMPANY, Millstadt, Ill.	
13239	Wheat Bran	Biloxi Milling Co., Biloxi.....
13240	Wheat Bran	Threefoot Bros. & Co., Meridian..... Guarantee.....
	MOHLENBROCK MILLING CO., Campbell Hill, Ill.	
13241	Bran	T. B. Cockrell, Itta Bena..... Guarantee
13242	Shorts	T. B. Cockrell, Itta Bena..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13224	4.52	5.20	6.84	18.25	59.10	6.09
13225	7.95	4.35	4.82	15.94	62.16	4.78
13226	7.85	4.11	4.86	16.19	61.76	5.23
13227	7.81	5.48	5.63	15.38	60.54	5.16
13228	7.73	5.23	5.35	15.88	60.49	5.32
13229	9.19	5.30	5.28	17.13	58.03	5.07
13230	8.22	5.60	5.47	15.94	59.67	5.10
13231	7.76	6.38	5.16	16.13	57.06	7.51
			4.00	16.00	48.00	6.00
13232	5.22	7.30	2.40	9.81	59.89	15.38
			3.50	10.00	55.00	12.00
13233	7.30	7.97	14.30	12.75	49.19	8.49
			8.00	13.00	49.50	9.75
13234	7.73	4.77	11.01	10.75	64.59	1.15
			5.00	10.00	50.00	12.00
13235	6.83	6.89	5.56	16.06	56.53	8.13
			3.50	13.50	50.00	12.00
13236	8.84	4.47	5.05	15.63	62.40	3.61
			3.50	13.50	54.00	8.50
13239	6.56	7.30	5.62	15.88	56.57	8.07
13240	7.61	7.27	4.52	16.00	53.25	11.35
			3.50	11.27	59.54	6.04
13241	7.91	6.93	4.16	15.56	57.59	7.85
			3.50	11.00	40.00	11.00
13242	10.04	4.04	4.72	16.63	60.00	4.57
			3.50	13.00	40.00	8.00

TABLE I.—Analyses of Commercial Feeding Stuffs.

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	NUTRILINE MILLING COMPANY, Crowley, La.	
13748	Nutriline	Merchants Grocery Co., Crystal Sp'gs
13244	Nutriline	Donaghue & Dee, Columbus
13749	Nutriline	W. A. McDonald, Bay St. Louis
		Guarantee
	D. G. PATTON & COMPANY, Jackson, Miss.	
13245	Corn Chops	W. F. Funchess & Co., Osyka
	GEO. P. PLANT MILLING CO., St. Louis, Mo.	
13246	Wheat Bran	Pegram & Harris, Pontotoc
13247	Wheat Bran	Rumble & Wensel Co., Natchez
13248	Wheat Bran	A. Beer & Co., Natchez
13249	Wheat Bran	R. L. Crook & Co., Vicksburg
13250	Wheat Bran	E. Bonelli & Co., Vicksburg
		Guarantee
	QUAKER OATS COMPANY, Chicago, Ill.	
13251	Banner Feed	Crawford Grocery Co., Greenville
13426	Banner Feed	Gaddis-McLaurin & Co., Raymond
13558	Banner Feed	Rogers & Jacobs Co., Shelby
13754	Banner Feed	T. B. Cockrill, Itta Bena
13755	Banner Feed	Crawford Grocery Co., Greenville
13756	Banner Feed	Clark, Herren, Campbell Co., Clarksd'le
13757	Banner Feed	Seward & Co., Ackerman
13758	Banner Feed	P. P. Williams & Co., Vicksburg
13759	Banner Feed	R. Viener & Co., Natchez
13760	Banner Feed	Geisenberger & Friedler, Natchez
13761	Banner Feed	Geisenberger & Friedler, Natchez
		Guarantee
	QUALITY MILLS, Enterprise, Kans.	
13252	Middlings	A. J. Lyons & Co., Meridian
	RALSTON PURINA COMPANY, St. Louis, Mo.	
13253	Purina Feed	T. E. Winn, Laurel
13254	Purina Feed	Rumble & Wensel Co., Natchez
13256	Purina Feed	The Goyer Co., Greenville
		Guarantee

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13748	11.03	10.74	7.25	9.81	48.29	12.88
13244	9.56	10.08	5.36	8.94	54.18	11.88
13749	13.08	9.30	9.15	10.44	47.93	10.10
			5.50	12.00	58.00	10.00
13245	15.53	1.26	3.92	7.44	70.60	1.25
13246	10.42	6.54	4.20	17.19	53.31	8.34
13247	9.01	6.00	4.18	16.00	56.89	7.92
13248	9.88	6.34	4.25	16.63	55.03	7.87
13249	7.16	6.58	4.16	17.50	55.78	8.82
13250	10.05	6.02	4.04	17.00	54.92	7.97
			4.00	16.00	54.00	9.00
13251	9.61	3.08	3.43	9.88	65.84	8.16
13426	9.62	3.41	3.68	10.88	64.60	7.81
13558	9.39	2.98	3.85	10.13	66.43	7.22
13754	9.78	3.32	4.19	11.69	64.83	6.19
13755	9.09	3.44	3.96	12.94	65.26	5.31
13756	8.04	3.09	3.89	12.50	67.58	4.90
13757	9.55	3.41	4.02	11.88	65.06	6.08
13758	6.86	3.35	3.50	11.00	67.95	7.34
13759	9.36	3.37	3.94	12.31	66.07	4.95
13760	9.26	3.14	3.82	12.44	66.14	5.20
13761	9.06	3.49	3.64	12.00	65.33	6.48
			3.75	9.75	63.00	10.50
13252	10.85	4.70	4.72	19.44	55.39	4.90
13253	9.03	3.70	4.35	11.13	62.27	9.52
13254	9.99	4.72	4.71	12.56	60.37	7.65
13256	9.32	4.53	4.59	12.19	62.21	7.16
			4.00	12.50	58.00	8.90

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13255	Poultry Feed	G. A. Wilson, Jr., Greenwood.....
13257	Poultry Feed	Biloxi Milling Co., Biloxi.....
13258	Poultry Feed	Tom Lyle Grocery Co., Meridian.....
	RANDOLPH MILLING COMPANY, Baldwin, Ill.	Guarantee.....
13259	Bran	T. S. Cunningham, Aberdeen.....
	REA & PAGE MILLING COMPANY Marshall, Mo.	Guarantee.....
13260	Shipstuff	Tom Lyle Grocery Co., Meridian.....
	REFUGE COTTON OIL COMPANY, Columbus, Miss	
13261	Mr. Durham Cow & Ox Feed	Holland & Avent, Eupora.....
		Guarantee.....
13778	Perfection Horse Feed	Refuge Cotton Oil Co., Columbus.....
		Guarantee.....
13779	Plow Boy Stock Feed.....	Refuge Cotton Oil Co., Columbus.....
		Guarantee.....
	ROBERTS & HAMNER GRAIN CO. Memphis, Tenn.	
13262	Corn Chops.....	Holland & Avent, Eupora.....
	SAXONY MILLS, St. Louis, Mo.	
13263	Wheat Bran	R. Schumaker, Holly Springs.....
		Guarantee.....
	SHANKS-PHILLIPS & COMPANY, Memphis, Tenn.	
13264	Chops	Bigham & Abernathy, Pontotoc.....
13265	Wheat Shorts.....	J. M. Watkins, Mathiston.....
13266	Wheat Shorts.....	J. W. Inzer, Pontotoc.....
		Guarantee.....
	STANARD-TILTON MILLING CO., St. Louis, Mo.	
13267	Wheat Bran	Planters Supply Co., Greenwood.....
		Guarantee.....
13268	Wheat Middlings	Planters Supply Co., Greenwood.....
13269	Wheat Middlings	McMahon Grocery Co., Greenville.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13255	10.75	1.64	4.25	10.88	69.51	2.97
13257	11.16	1.87	4.72	11.06	68.51	2.68
13258	10.33	1.65	3.90	11.00	70.41	2.71
			3.60	11.00	65.00	4.00
13259	8.15	6.35	4.86	15.38	56.06	9.20
			3.50	14.50	50.00	10.62
13260	8.23	6.78	4.43	16.88	55.06	8.62
13261	5.95	6.56	4.52	14.56	49.51	18.90
			3.50	13.00	50.00	20.00
13778	9.83	5.01	4.78	13.50	60.64	6.24
			4.00	11.00	55.00	12.00
13779	8.42	4.01	3.83	10.88	63.88	8.98
			4.00	11.00	55.00	12.00
13262	14.04	1.31	4.22	8.44	70.34	1.65
13263	9.69	6.07	4.66	17.88	53.97	7.73
			3.50	12.00	52.00	10.00
13264	14.02	1.50	4.69	7.88	70.38	1.53
13265	9.58	4.70	4.94	19.81	56.46	4.51
13266	10.11	4.37	4.84	20.75	55.34	4.59
			3.50	10.00	50.00	12.00
13267	9.02	6.40	4.62	19.06	53.27	7.63
			3.50	14.00	54.00	10.00
13268	10.73	3.82	4.73	19.06	56.57	5.09
13269	11.14	3.80	4.67	18.50	55.94	5.95
			5.00	16.00	40.00	7.00

TABLE I.—Analyses of Commercial Feeding Stuffs.

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	STEELEVILLE MILLING CO., Steeleville, Ill.	
13270	Bran	Hanes & Hood, Vicksburg..... Guarantee.....
13271	Middlings	Jackson-Wallace Co., Kosciusko.....
13272	Middlings	Holland & Avent, Eupora..... Guarantee.....
	TENNESSEE FIBER COMPANY, Memphis, Tenn.	
13237	Creamo Brand Feed Meal (Cow and Ox)	D. Jean Mitchell, Scranton.....
13273	Creamo Brand Feed Meal (Cow and Ox)	Gilmore & May Co., Amory.....
13274	Creamo Brand Feed Meal (Cow and Ox)	Gulfport Grocery Co., Gulfport.....
13275	Creamo Brand Feed Meal (Cow and Ox)	Union Naval Stores, Gulfport..... Guarantee.....
	THREEFOOT BROTHERS & CO., Meridian, Miss.	
13276	Mixed Feed	Threefoot Bros. & Co., Meridian..... Guarantee.....
	THE VALLEY MILLING CO., St. Louis, Mo.	
13787	Delta Feed	C. J. Edwards Co., Vicksburg..... Guarantee.....
	JOHN WADE & SONS, Memphis, Tenn.	
13277	Wheat Bran	W. B. Potts & Sons, Kosciusko.....
13278	Wheat Bran	J. W. Inzer, Pontotoc.....
13279	Wheat Bran	Roane & Sons, Grenada.....
13280	Wheat Bran	A. L. McCormick, Senatobia.....
13281	Wheat Bran	Gilmore & May Co., Amory..... Guarantee.....
13282	Chops	Roane & Sons, Grenada.....
13283	Chops	A. L. McCormick, Senatobia.....
13284	Chops	T. J. Locke & Co., Columbus.....
13285	Chops	Harris & Co., Meridian.....
13286	Purity Feed	A. L. McCormick, Senatobia.....
13287	Purity Feed	Miss. Italian Supply Co., Greenville..... Guarantee.....
13289	Wheat Shorts.....	T. J. Locke & Co., Columbus.....
13290	Wheat Shorts.....	Gilmore & May Co., Amory.....
13291	Wheat Shorts.....	W. B. Potts & Sons, Kosciusko.....
13292	Wheat Shorts.....	G. Lowenberg & Co., Kosciusko..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent
13270	8.95	5.67	5.01 3.50	16.50 14.50	56.27 50.00	7.60 10.00
13271	9.64	3.28	4.42	17.88	61.52	3.26
13272	8.23	4.27	5.16 4.00	17.69 15.00	59.42 55.00	5.23 5.00
13237	6.36	5.30	5.36	23.56	41.19	18.23
13273	6.73	4.58	5.49	25.56	38.90	18.74
13274	7.96	4.82	4.61	23.94	39.18	19.49
13275	7.79	5.24	5.35 5.00	26.75 20.00	36.83 36.00	18.04 25.00
13276	8.16	7.97	10.06 5.00	10.94 9.25	54.52 61.00	8.35 8.50
13787	7.07	3.29	5.96 5.00	9.31 8.50	67.99 50.00	6.38 12.00
13277	9.70	5.87	4.47	15.38	56.58	8.00
13278	8.47	6.30	4.53	15.63	56.60	8.47
13279	9.16	6.65	4.65	15.25	55.98	8.31
13280	8.91	6.70	4.59	16.63	54.47	8.70
13281	7.79	5.90	4.79 3.50	15.75 10.00	57.60 50.00	8.17 12.00
13282	11.14	1.43	4.54	8.50	71.99	2.40
13283	12.61	1.36	4.34	7.88	71.65	2.16
13284	15.20	1.22	3.49	7.44	70.65	2.00
13285	11.75	1.42	4.65	8.81	71.23	2.14
13286	11.97	2.53	4.53	8.63	66.41	5.93
13287	12.32	2.41	4.40 4.25	8.75 9.25	67.07 65.00	5.05 5.50
13289	11.56	4.37	6.32	18.88	55.07	3.80
13290	10.22	4.61	5.60	18.38	54.69	6.50
13291	10.50	5.60	4.98	19.75	54.93	4.24
13292	11.34	4.42	5.18 3.50	19.31 10.00	54.41 50.00	5.34 12.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
WASHBURN - CROSBY CO., Minneapolis, Minn.		
13293	Standard Middlings	Houston Ice & Coal Co., Houston.....
13294	Standard Middlings	J. C. McClinton, Newton
13295	Standard Middlings	C. H. Stevens, Richton.....
		Guarantee.....
WEBB & MAURY, Memphis, Tenn.		
13296	Wheat Bran	Veazy-Clarke Co., Coldwater.....
		Guarantee.....
13297	Chops	Merchants Grocery Co., Hattiesburg.....
13298	Chops	Tom Lyle Grocery Co., Meridian.....
13299	Chops	L. A. Latham & Sons, Pontotoc.....
13300	Chops	F. S. Leavell, Oxford.....
13301	Chops	Union Naval Stores, Gulfport.....
13302	Chops	A. J. Lyons & Co., Meridian.....
13303	Chops	Winner-Klein & Co., Meridian.....
13304	Chops	Queen City Feed Co., Meridian.....
13305	Chops	Threefoot Bros. & Co., Meridian.....
13855	Chops	W. O. Warrell, Vicksburg.....
13306	Wheat Shorts.....	Holland & Avent, Eupora.....
		Guarantee.....
YATES & DONELSON COMPANY, Memphis, Tenn.		
13307	Wheat Bran	Merchants Grocery Co., Brookhaven.....
13308	Wheat Bran	W. F. Funches, Osyka.....
13309	Wheat Bran	McInnis & Sturgis, Meridian.....
13310	Wheat Bran	Winner-Klein & Co., Meridian.....
13311	Wheat Bran	Myer Bros., Meridian.....
13312	Wheat Bran	Tom Lyle Grocery Co., Meridian.....
13313	Wheat Bran	Yazoo Grocery Co., Yazoo City.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13293	9.77	4.45	5.47	17.81	56.04	6.46
13294	10.09	4.64	5.46	18.50	54.51	6.80
13295	10.12	4.45	6.46	18.56	53.75	6.66
			4.00	15.00	55.00	8.00
13296	9.59	6.51	3.88	17.81	54.33	7.88
			3.50	10.00	50.00	12.00
13297	15.20	1.18	3.52	7.63	71.26	1.21
13298	15.14	1.13	4.13	7.25	71.08	1.27
13299	11.89	1.68	5.37	9.06	70.30	1.70
13300	13.96	1.18	3.83	7.63	72.28	1.12
13301	13.87	1.38	4.70	8.06	70.54	1.45
13302	12.20	1.44	5.59	8.44	70.25	2.08
13303	15.10	1.28	4.03	8.00	70.29	1.30
13304	11.74	1.15	4.42	8.75	72.51	1.43
13305	11.33	1.16	4.29	9.19	72.45	1.58
13855	7.97	1.14	3.67	8.13	77.99	1.10
13306	9.52	4.30	7.00	17.94	55.32	5.92
			3.50	10.00	50.00	12.00
13307	10.47	5.45	4.74	16.25	56.74	6.35
13308	10.35	5.15	4.86	15.94	57.46	6.24
13309	11.01	5.17	4.94	15.94	56.21	6.64
13310	8.69	4.80	4.87	17.69	57.65	6.30
13311	8.70	5.04	4.87	17.31	58.36	5.73
13312	7.90	5.40	4.70	17.75	57.92	6.35
13313	8.96	6.53	5.24	18.38	54.04	6.82
			3.58	14.85	54.60	10.00

Mississippi Agricultural Experiment Station.

BULLETIN No. 139

BOLL WEEVIL IN MISSISSIPPI, 1909.

By. R. W. HARNED.

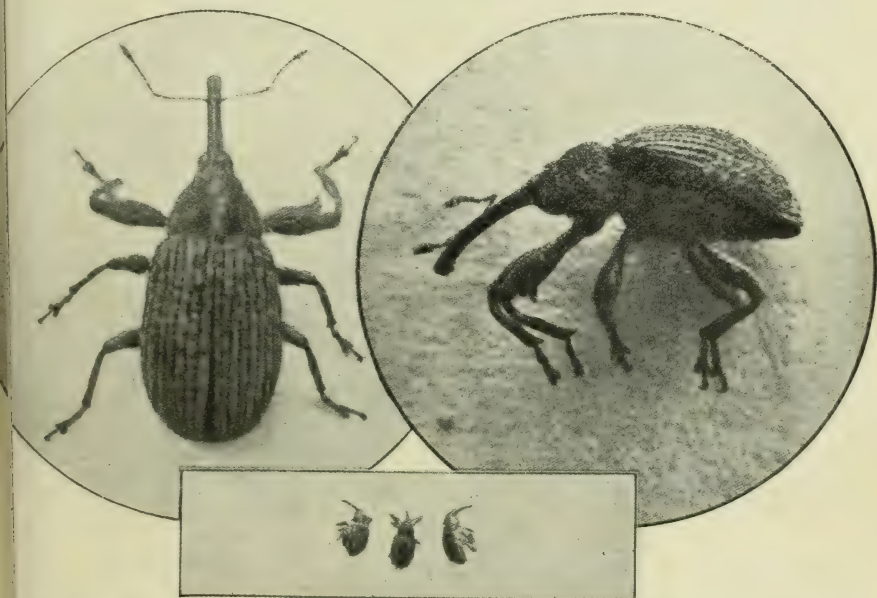
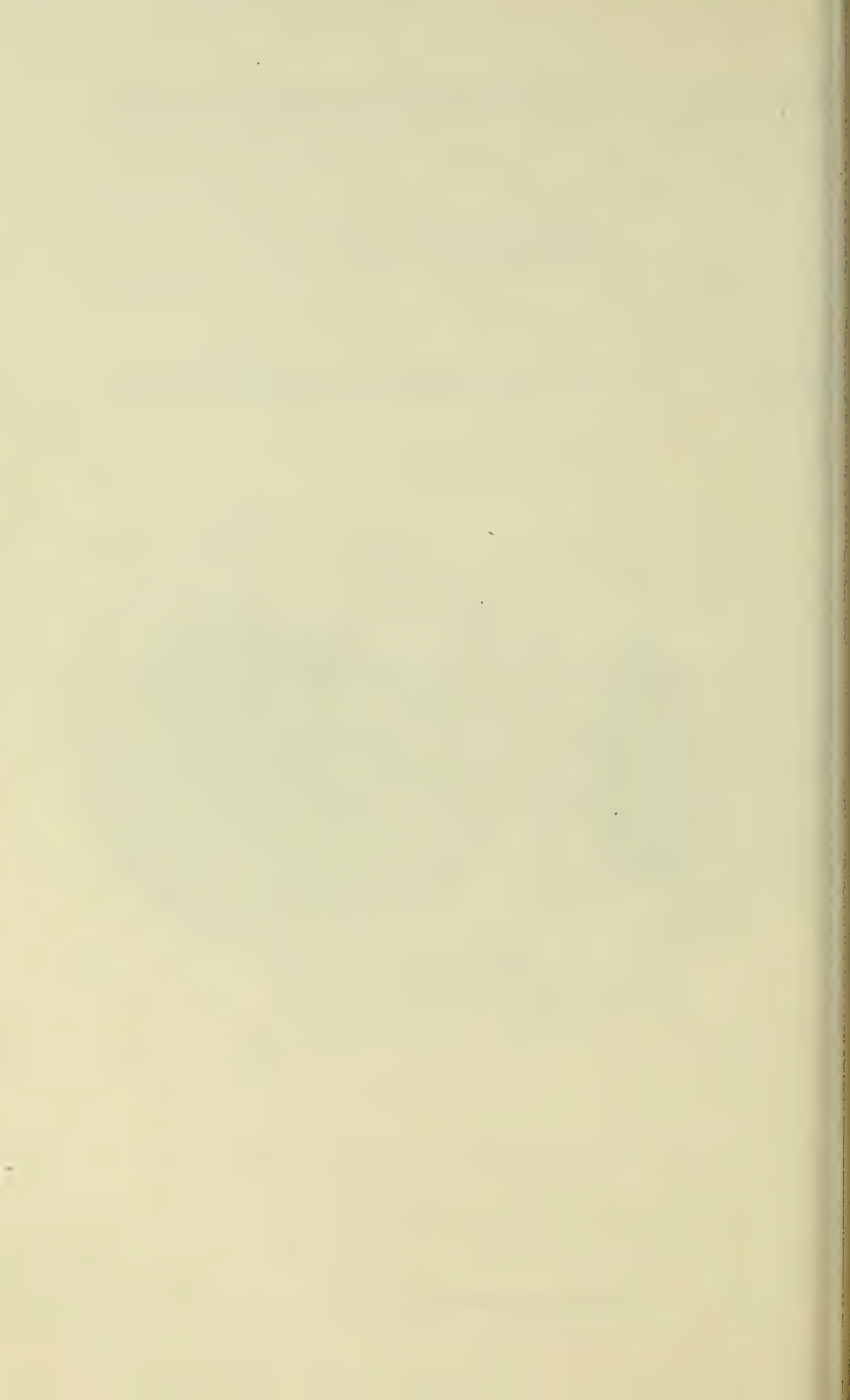


FIG. 1. Boll Weevil; enlarged above; natural size below. (Photo by Herrick).

AGRICULTURAL COLLEGE, MISSISSIPPI

MARCH, 1910.



BOLL WEEVIL IN MISSISSIPPI, 1909.

INTRODUCTION.

The main purpose of this bulletin is to give as near as possible the status of the boll weevil in this state at the close of the season 1909. In every county in this state there are people who think that the boll weevil is on their farms. In many cases there is not a boll weevil in a hundred miles of them. There is the greatest confusion as to how the boll weevil appears and as to its origin. The writer has met cotton planters who insist that the boll weevil has been on their farms for many years and others who claim to have obtained this insect in cotton seed from Georgia and still others who will not believe there is such a thing as a boll weevil. It is mainly to correct such false ideas that this bulletin is written. A great body of intelligent farmers in this state have kept informed in regard to the spread of this pest as well as to the best known methods of controlling it. They have obtained their information from the newspapers, bulletins of the U. S. Department of Agriculture, State Department of Agriculture, Experiment Stations, special agents of the U. S. Department of Agriculture and from the farmers' institute workers. All of these and many other agencies should be given credit for the campaign of education that has been waged in this state during the past few years.

In order to answer many questions that are constantly being asked, this bulletin deals somewhat with the life history and habits of the boll weevil and with some of the insects with which it has often been confused in this state. It will also give the best methods now known of controlling this pest.

Acknowledgments.—The writer finds it impossible to give proper credit for much of the information concerning the life history, habits, and methods of control of the boll weevil. The Bureau of Entomology of the United States Department of Agriculture, the Louisiana State Crop Pest Commission, and the State Entomologists of Texas are the sources of most of the original information regarding this insect. The writer has read carefully every available publication upon this subject and is under special obligations to the writings of Mr. W. D. Hunter, Dr. L. O. Howard, Mr. Wilmon Newell and his assistants, Mr. E. D. Sanderson, Mr. W. D. Pierce, Dr. W. E. Hinds and Mr. C. H. T. Townsend. We are indebted to Dr. L. O. Howard,

Chief of the Bureau of Entomology, for the illustrations taken from the publications of that Bureau. The illustration on the cover is from photographs by Professor Glenn W. Herrick, formerly Entomologist of this Station. Mr. W. D. Hunter, who is in charge of the boll weevil investigations of the Bureau of Entomology, and his assistant, Mr. W. D. Pierce, kindly furnished much information regarding the spread of the boll weevil in Mississippi. It has been the endeavor of the writer to give proper credit for the finding of the boll weevil in each county. If any errors or mis-statements of any kind are found, the writer will consider it a favor if his attention is called to them.

LIFE HISTORY AND HABITS.

The boll weevil is an insect with four stages in its life history—egg, larva or grub, pupa or quiescent, and adult stage.

Egg stage.—The eggs are usually laid within the squares of the cotton plant. When the squares are scarce, the weevils will lay their eggs within the bolls preferring the small tender ones, but if these are scarce they may attack larger bolls. The mouthparts of the adults are located at the end of the snout; by means of their tiny jaws they eat small holes into the squares and then deposit one egg in each puncture. Usually only one egg is deposited in each square. In a large boll where there is enough food for more than one larva, several eggs

are sometimes deposited. The eggs are so small and inconspicuous that they are difficult to find. They hatch usually in about 3 or 4 days. This varies with the temperature. The length of time required for hatching has been known to vary from 2 to 15 days.

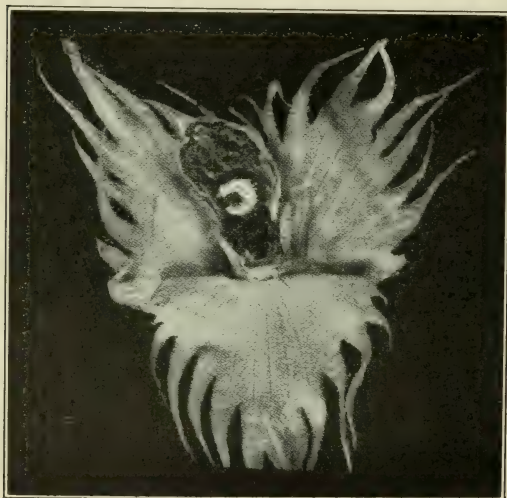


FIG. 2. Larva full grown, ovary in square entirely destroyed. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.),

Larva or grub stage (Figures 2 and 3).—The egg hatches into a tiny white footless grub with a brown head and still darker jaws. This grub

begins at once to feed upon the tissues within the square or boll and grows rather rapidly. Generally from 6 to 12 days is required for the larvae to become full grown. However, this depends very much upon the temperature. In the warmest weather of summer the larvae will make their full growth in 6 days, but in the cooler weather of spring and fall a longer time is required.



FIG. 3. Full grown larva in a square of usual size. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

Under certain conditions they may remain from 20 to 30 days in the larva stage. It is said that the larvae in large bolls require a much longer time to develop than those that develop in small bolls or squares. The larvae always remain out of sight. It is in this stage that the greatest damage is done. They devour the entire inside of the forms and squares and make cells in the larger bolls. When full grown they pupate within these cells.

Pupa or quiescent stage.—This is the stage that is similar to the cocoon stage of moths. It is the intermediate stage between the larva and the adult. From 3 to 5 days is usually required for pupation. However, in cool weather a longer period may be necessary. From the pupa emerges the adult weevil.

The adult stage (Figures 1 and 11).—The adult develops from the pupa within the square or boll and soon begins to eat its way out. This is done by eating a hole large enough to allow it to escape. The squares with the holes from which the adults have emerged (Figure 4) somewhat resemble those damaged by the boll-worm, and are sometimes the cause of confusion by people not acquainted with the work of both insects. When the adults first emerge they are almost pink in color but rapidly turn darker until they have a chocolate color. The adults usually are from one-fourth to three-eighths of an inch long and about half as broad. The body is thinly covered with fine light colored hairs. These rub off rather readily and the old adults may usually be recognized by the loss of most of these hairs and a conse-

quent darker brown color. In fact the adults that pass through the winter usually have a darker appearance than those that are found during the summer. The snout has a shiny black color and is slightly

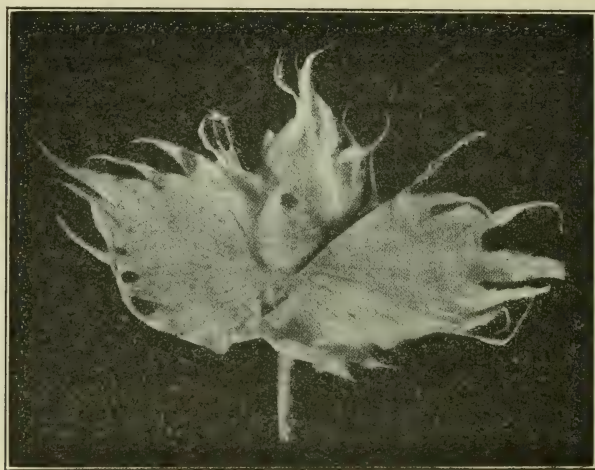


FIG. 4. Square showing emergence hole of weevil. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

curved. The jaws are located at the end of this snout. The antennae or "feelers" are near the end as is shown in the illustrations. The snout is about half as long as the body.

How to distinguish the adults.—The safest plan for all who are not well acquainted with this insect is to send any doubtful specimens to the Entomologist, Agricultural College, Miss. However, there are a few characteristics that will assist in separating this species from the hundreds of other weevils that resemble it somewhat. It has a characteristic shape, a fairly characteristic size and usually a dark brown or chocolate color. On each front leg are two spines—one somewhat larger than the other. The wing-covers have a ridged or lined appearance. These lines are parallel. On the prothorax just back of the eyes and snout is usually a light colored line running to the wing covers. This line is caused by the fine hairs being somewhat more numerous at this part of the body. In old specimens this light colored line is not as apparent as in fresh specimens.

Males and females.—The two sexes are produced in about equal numbers but they resemble each other so much in appearance that it is out of the question for the average person to distinguish them.

Food plants (Figures 5, 6 and 7).—The boll weevil has never been known to feed naturally upon any other plant but cotton. The re-



FIG. 5.—Square riddled with feeding punctures. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

ports of boll weevils feeding upon peas and various other plants are undoubtedly due to the fact that some of the other insects resembling the boll weevil have been mistaken for it. When captured and placed in confinement the boll weevil may be starved until it will feed upon other plants to a slight extent.

Rate of increase.—Between two and three weeks is generally required for a boll weevil to develop from an egg to an adult. This varies with the temperature as shown in the discussion of the different stages. The warmer the weather the more rapidly do they develop. They begin laying eggs usually as soon as the first squares appear on the plants and continue to increase until checked by frost. The average number of eggs laid by each female is said to be 139. "A conservative estimate of the possible progeny of a single pair of weevils during a season beginning on June 20th, and extending to November 4th, is 12,755,100." This is a quotation from Mr. Hunter, and, that he has only counted on four generations in a season, and on each female laying only 100 eggs shows how conservative the estimate is.

Age of weevils.—I have often been asked how long a boll weevil will live? The age varies greatly. Those that are born during the summer probably do not live over sixty days. They live long enough to lay their eggs, and then they are ready to die. However, the weevils that mature late in the fall are the ones that pass through the winter. They must live for at least six months and probably many of them live for eight or nine months. Mr. Hunter says: "The longest-lived weevil on record lived from December 10 to the following October, a period of about eleven months. Undoubtedly such prolonged life is exceptional."

Does the boll weevil work at night?—Careful observers have found that the boll weevil is not active after sundown.

Is the boll weevil attracted to lights?—I have been asked this question many times by people who have found closely related insects at lights. Although many other weevils are sometimes attracted to lights at night, the writer has never heard of a single instance where a boll weevil has been found among them.

Mexican and Texas boll weevils.—There is considerable confusion in the minds of many people in regard to these names. Some think that there are two kinds of boll weevils, one from Mexico and the other from Texas. There is but one species of boll weevil. It is probably native of Mexico but Texas was the first state in this country that was infested.

Why does the boll weevil "sull"?—When a boll weevil is disturbed it will often "play 'possum" or "sull", that is, it will feign death and curl up its legs and fall prostrate. This habit is not true of all boll weevils but is true of a great many. The habit of feigning death is a means used by many insects to protect themselves from enemies. By falling to the ground the boll weevil is out of sight and not likely to be found by the enemy that was disturbing it.



FIG. 6. Bloom distorted by many feeding punctures made when about to open. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

Effect of frost.—The boll weevils are active until frost checks them in the fall. The immature stages are probably always killed during the winter, but the adults live through the winter, or "hibernate." The adults are not killed but become dormant and remain in this condition until warm weather when they again become active, continue feeding and laying eggs. An early severe frost is much to be desired as

this makes it impossible for weevils to mature late in the fall. The hibernating adults must live for a longer period before having an opportunity to lay eggs and their chances of not living are proportionately greater.

Hibernation.—This is the condition described in the previous paragraph. It is the winter condition of an insect. In the case of the boll weevil it is always passed in the adult stage. When cool weather arrives the weevils begin to look for hibernating quarters. Any place that will afford some protection will do. Most of the weevils leave the cotton fields and hibernate under grass and weeds, in Spanish moss, under rubbish, or in any place where protection is given. Many weevils remain in the cotton fields, in cracks and crevices in the ground, or in the empty cotton burs. As a matter of fact the majority of the boll weevils die during the winter. Only a small percentage of them hibernate successfully. There are therefore but a comparatively few weevils left to infest the fields in the spring.

Effect of the winter of 1909-1910 in Mississippi.—It will be impossible to state just what effect the past winter has had upon the boll weevils until next summer when they have emerged from hibernation. As a general thing during a severe winter a larger percentage of weevils will be killed than during a mild winter. During the past season there has been more cold weather, more sudden changes from warm to cold, and more snow and sleet than during the other two winters that the boll weevils have been in this state. It is to be hoped that there will be but few weevils to begin work this spring, and it is even possible that the past winter will give the weevils a set back, but that is very doubtful. If there had been a very early frost there would be more prospect of this. At any rate it will be interesting to observe just what effect a winter like the past one will have upon the boll weevil in this state.



FIG. 7. Weevils feeding extensively on medium sized boll. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

Relation of birds to the boll weevil.—Thirty-eight species of birds are known to eat boll weevils. The swallows, night-hawks and orioles are the most important. The night-hawk or bull-bat devours large numbers of the weevils. The orioles show a preference for the boll

weevil. "There are six species of swallows in the Southern states, and these seem to be the most important in destroying the weevil. The martin is one we can easily protect and induce to multiply because it is domestic and makes its nests in boxes, gourds, etc., placed on poles or roofs of buildings." The meadow larks and mocking-birds also feed upon the boll weevil, and even the bob-white or "quail" will eat them. Many other birds will undoubtedly adapt themselves to the boll weevil and devour them in increasing numbers each year.

In the fight that we are waging against this insect, it is pleasing to know that we have some useful allies among the birds. All insectivorous birds should be protected; every farmer should take an active part in their protection.

Will the boll weevil disappear?—There is an erroneous idea prevalent in many sections that the boll weevil has been here before and will again disappear. The boll weevil was never here before, and there is no reason for believing that it will ever disappear. The boll weevil is here to stay. It will probably spread gradually over the entire cotton belt. In time its damage will probably gradually grow less and less for two reasons: First, nature will become adapted to the new insect. Our native birds and other predaceous animals, parasitic and predaceous insects will all gradually adapt themselves to the boll weevils and destroy them in increasing numbers each year. Second, the cotton growers will become educated to the weevils, and will learn how to raise cotton in spite of this pest.

HISTORY.

In Mexico and Cuba.—The boll weevil is probably a native of Southern Mexico or Central America. Cotton grows naturally in this region; and it is more than likely that the boll weevil had been a pest to the wild cotton of this area centuries before the first white man reached the New World. After Mexico was settled by white people, cotton became an article of commerce and was planted more or less throughout the country. Therefore conditions became favorable for the spread of the boll weevil from its native home. It did not have to make any very sudden changes but probably spread gradually farther and farther each year until it reached the United States in 1892. Nothing very definite is known about the spread of the weevil in Mexico, except that it was described in 1843, by an entomologist named Boheman, from specimens received from Vera Cruz. In 1871 the boll weevil was found in Cuba. It was probably accidentally introduced from Mexico. In 1885, the first account of the boll weevil

damaging cotton was recorded. Some weevils were bred in Washington, D. C., from cotton bolls sent from northern Mexico.

In the United States.—Just when the boll weevils reached this country is not known; but 1892 is generally accepted as the year that they crossed the Rio Grande into Texas, in the vicinity of Brownsville. In 1894 they were found in half a dozen counties in southeastern Texas. This was the first year that their damage was severe enough to attract considerable attention. During the next ten years the weevils spread steadily into new territory, but did not get outside of Texas. Because of the small amount of rainfall in western Texas the spread of the boll weevil in that direction has been slow. It is not likely that the boll weevil will ever become a serious pest in that region, as it does not thrive in arid climates. On the other hand, it is probable that the damage of this insect will always be greater in the more humid regions of the cotton belt that lie east of Texas.

Louisiana became infested in 1904, when the weevils spread over a large portion of the western part of that state. During the previous year, and perhaps even before that, there were some isolated infestations in western Louisiana; but the general line of infestation did not really reach that state until early in the season of 1904. Louisiana is at the present time the only state entirely within the infested area. The whole state was practically infested in 1908, and during the past season there is little doubt but that the boll weevils reached every part of the state. During the season of 1907 the weevils crossed the state at its narrowest point and, crossing the Mississippi river, spread into three counties of southwestern Mississippi.

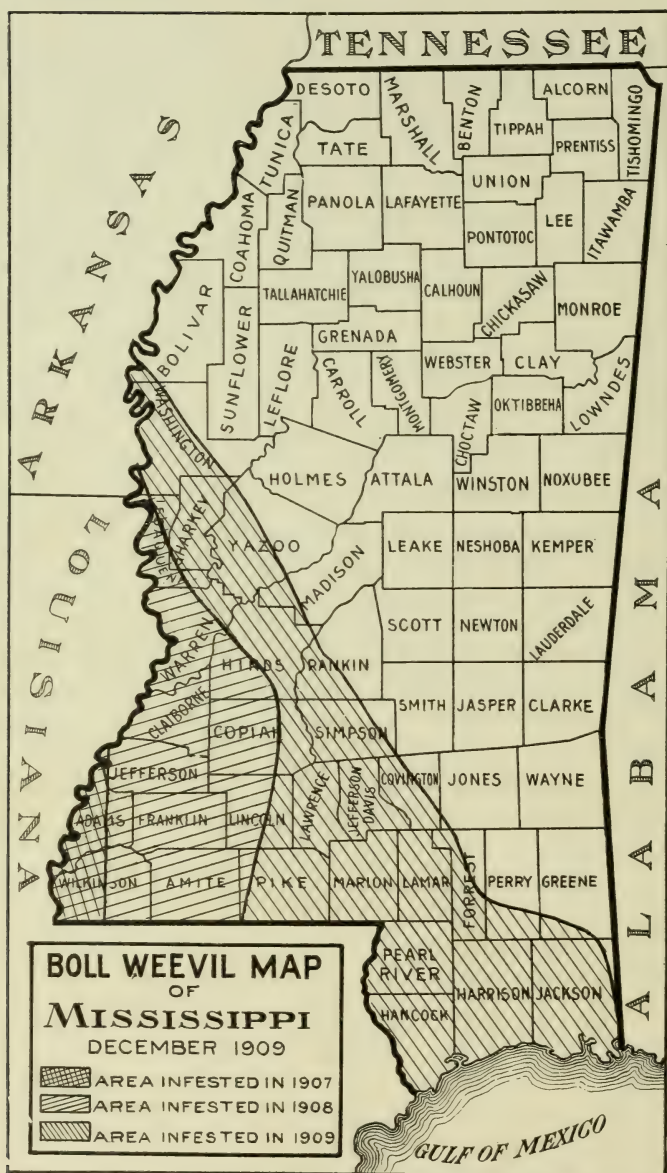


FIG. 8. Map of Mississippi showing the spread of the boll weevil in 1907, 1908 and 1909. (Original.)

THE BOLL WEEVIL IN MISSISSIPPI.

1907.

The first boll weevils actually found in this state were taken on September 20, 1907, by Mr. W. D. Hunter in a cotton field about six miles south of Natchez, Miss. The writer spent the first week of October, 1907, in Adams and Wilkinson counties, and found that the weevils had crossed the river all the way from Natchez southward to the Louisiana line. Plenty of weevils were found in cotton fields along the river bank, and for a distance of from two to three miles east of the river. During October and November, 1907, the boll weevils spread half way across the counties of Adams and Wilkinson, and were undoubtedly in the western part of Jefferson county.

1908.

During the season of 1908, the boll weevil spread entirely over Adams, Wilkinson, Jefferson, Amite, Franklin, and Claiborne counties. The western part of Pike county was slightly infested, as was the western half of both Lincoln and Copiah counties. The southwestern parts of Hinds, Warren, and Issaquena counties were infested before the end of the season. The damage done by the boll weevil in the greater part of this area was very slight. Only in the extreme southwestern portion of the state was the damage serious. From all reports this was due largely to the fact that the planters had made very little preparation for meeting this pest. They continued to use the same methods of farming that they had followed for years, and as a consequence the boll weevil destroyed a considerable portion of their cotton.

During October, 1908, two isolated infestations were found considerably ahead of the boll weevil line: one in the eastern part of Yazoo county, and the other in the eastern part of Hinds county. It is not known how the weevils reached these places. Possibly they migrated of their own accord; but more probably they were carried to these places from boll weevil infested territory. Both of these infestations were apparently killed out during the winter, as careful searching during the entire season of 1909 failed to reveal any weevils in either of these locations.

1909.

During 1909, the boll weevil spread over a much larger portion of the state than during the previous year. Pike, Lincoln, Copiah, Hinds, Warren, and Issaquena counties were partially infested in

1908, but they are now entirely within the infested area. Lawrence, Jefferson Davis, Marion, Lamar, Pearl River, Hancock, and Harrison are now entirely within the infested area. A large portion of Washington, Sharkey, Yazoo, Rankin, Simpson, Covington, Forest, Perry, and Jackson counties are now infested. A small area of the southwestern parts of Bolivar, Madison, Jones, and Greene counties, also, are infested. It is probable that a small portion of southwestern Smith County is infested, but no weevils have actually been taken from this county. It is barely possible that the extreme southwestern portion of Sunflower county has been reached by the boll weevils. There is no reason for believing that any other county is at all infested. It is of course possible that there may be a few isolated infestations ahead of the boll weevil line. These have been rare in the past, and many "boll weevil scares" were investigated during 1909 and in every case it was found that other insects had been mistaken for boll weevils.

Two things are at once noticeable in regard to the spread of the boll weevil in this state during the past season. From the northern portion of the infested territory, the spread eastward has not been as great as was expected; and in the southern part of the state, the insect has gone farther than in any one year since its advent into Texas in 1892. It is not difficult to explain why the boll weevil has spread in the way it has. It is now a well known fact that drouth tends to check the increase of weevils, and that moisture aids their increase. The reason for this is discussed elsewhere in this bulletin. The boll weevils spread largely in search of food. If there is an abundant supply of food, their spread is naturally slow; but if the cotton fields are scattered, they spread much more rapidly. During July and August, there was a period of continued drouth and extreme heat in the northern portion of the infested area. These unfavorable weather conditions, although damaging the cotton crop, greatly decreased the number of boll weevils—so much, in fact, as to have undoubtedly checked their spread. Just east of this infested area there is an abundance of cotton raised. The migrating weevils did not have to travel far for food, and therefore did not go very far to the east. These two factors give us the reasons why the spread of the boll weevil has not been greater in Washington, Yazoo, Madison, and Rankin counties.

Exactly opposite conditions prevailed in the southern portion of the state. Along the coast there was plenty of rainfall; and in the southern and especially southeastern counties of the state, the cotton

fields are very scattered—in many cases miles apart. The greater supply of moisture meant that the weevils were not diminished in numbers as they were in the infested counties farther north. There were therefore more weevils to spread eastward and these found less cotton and accordingly had to go long distances in search of food. These facts explain the surprising spread of the boll weevil from the western part of Pike county to the eastern part of Greene and Jackson counties, or approximately to the Alabama line—about a hundred and twenty miles.

The cotton season of 1909 was a very peculiar one in this state. For the greater part of the state there is little doubt but that less cotton was produced than for many years. In some sections, however, conditions were very good, and certain counties produced large crops. The southeastern and south central portions of the state fared well. Until the final statistics are gathered it will be impossible to know just how this season compares with other years. This year's crop would have been very light if the boll weevil had never reached Mississippi. In fact, there were several other factors that played a far greater part in lessening the cotton crop than the boll weevil did.

First, the weather conditions were very unfavorable over the greater part of the state. During April, May and June there was so much rain that cotton was not planted early; a large part of that which was planted was never cultivated; and even much of that which was cultivated had been so nearly drowned out that it was badly stunted. The long, very wet spring was probably the main cause of the poor crop of 1909.

During July and August, there was a long hot and exceedingly dry period that played havoc with the small bolls. From all over the state came complaints regarding the "shedding of the bolls." Many people could see no reason for this falling of the bolls, and at once blamed any insect that they might find upon the plants. As a result many innocent and even beneficial insects were sent to us for identification; the people sending them were sure that these insects had caused the small bolls to shed. Other people concluded that the boll weevil must have reached them, especially if they happened to find an insect that in some way resembled this pest. In this manner many false reports went out as to the appearance of the boll weevil. This shedding or falling of the small bolls in midsummer was caused by physiological trouble due to the excessive heat and drouth; and was

not caused by insects of any kind. This was probably the second factor in reducing the size of the cotton crop in this state.

Taking the state as a whole, the third factor in lessening the production of cotton, in the opinion of the writer, was cotton anthracnose,



FIG. 9. Cotton bolls showing different stages of pink boll rot or cotton anthracnose. (Original.)

or the pink boll rot of cotton (figure 9). The wet spring was probably favorable to the increase of this fungous disease. At any rate, the disease appeared to be very prevalent in all parts of the state. The writer visited cotton fields in at least one half of the counties and in all sections of the state, and found this disease in almost every field. In some cases it was doing very little damage; but in others it had destroyed from 25 per cent to 50 per cent of the cotton bolls. In one field the writer counted the bolls on a number of plants, and found from 75 per cent to 90 per cent of the bolls diseased. This was of course an exceptional case, but it simply shows the possibilities of this disease. Certain varieties of cotton seem much more likely to have anthracnose than others. Hence, great care should be used to select the varieties that are least susceptible to this disease, and to obtain seed if possible from regions where this disease is not abundant. At the present time anthracnose causes a greater loss in this state than the boll weevil.

The fourth cause of the poor crop in this state was the cotton boll-worm. This pest has always been with us. Some years it does

much more damage than others. Complaints of this insect came from all sections of the state. There is little doubt but that it did more damage during the past year than in any recent year.

Probably the boll weevil deserves the fifth place, but even that is doubtful, as this pest was serious in only about twelve counties. In the counties where the boll weevils were numerous they undoubtedly did more damage than any other insect or plant disease attacking cotton; and as the weevils spread throughout the entire state this will probably continue to be the case.

Besides the five causes already mentioned for the poor cotton crop in Mississippi this year, there might also be mentioned a number of other insect pests and plant diseases that caused more or less damage. The total loss caused by these pests amounted to a much larger sum than the average person would imagine.

BOLL WEEVIL INFESTED COUNTIES.

Adams County.—Although Wilkinson county was probably the first county in this state infested by the boll weevil, the first weevils actually found were taken about six miles south of Natchez in Adams county by Mr. W. D. Hunter, of the Bureau of Entomology, on September 20, 1907. On September 22, Mr. C. R. Jones, one of Mr. Hunter's assistants, obtained more weevils around Natchez. The writer spent the first week of October working along the Mississippi river in Adams and Wilkinson counties, and found the weevils were more numerous toward the south. It was quite evident that Wilkinson county had been infested longer than Adams county. The weevils were much more numerous at Kienstra and Arnot in the southern part of the county than they were around Natchez. At that time the line of infestation probably did not extend more than five miles east of the river but by the time the weevils were checked by frost they had gone half way across the county. The boll weevil reached Adams county too late to do any very serious damage in 1907. An average crop was made in this county in 1907. During 1908 the weevils spread throughout the entire county. As a general thing the planters gave this pest very little attention and in consequence the weevils did considerable damage—especially in the western part of the county. The cotton production fell off about one-third but this was to some extent due to the reduced acreage.

Amite County.—The boll weevil reached the western part of this county probably about August 1, 1908. The first weevils actually found were taken about nine miles east of Centerville by Mr. C. W.

Flynn of the U. S. Bureau of Entomology, on August 18, 1908. By the end of the season of 1908, the pest had covered the entire county. However, the weevils reached this county too late to materially damage the crop, as Amite county produced more cotton in 1908 than in either of the three preceding years.

Bolivar County.—The boll weevil reached the southwestern corner of this county late in 1909. They were found at Rex and Lamont on November 5, 1909, by Mr. E. S. Tucker, of the United States Bureau of Entomology. This of course was too late for them to do any damage. It is probable that the weevils will spread throughout the entire county during 1910, although if the planters can mature their cotton early, the boll weevil damage may not be at all serious next year.

Claiborne County.—This county was probably first reached by the boll weevils during August, 1908. The first record of weevils taken in this county was made by Mr. W. D. Pierce and Mr. H. S. Smith, at Port Gibson, Mississippi, on September 17, 1908. However, before frost had checked their spread the weevils had covered the entire county. They reached this county too late to do any very serious damage as the cotton production for this year was about up to the average. During November, 1908, the writer visited the eastern part of this county and at that time the infestation was light, but there were enough weevils to make a good start in 1909. Due largely to the efforts of Mr. G. H. Alford, County Commissioner of Agriculture, during 1909 this county made a very strong and concerted fight against the boll weevil—probably the best fight that has ever been waged in an entire county.

Copiah County.—The first boll weevils actually taken in this county were found at Crystal Springs by Mr. W. D. Pierce, of the United States Bureau of Entomology, on October 28, 1908. It is probable that the weevils reached this county early in September, 1908. However, their damage was very slight as the county produced more cotton than during the previous year. At least two-thirds of Copiah county was within the infested territory before the end of 1908. By the middle of September, 1909, the entire county was infested.

Covington County.—The first boll weevils probably reached this county late in September, 1909, but too late to do any serious damage this year. By the time they were checked by frost the weevils had probably crossed the Gulf & Ship Island Railroad tracks, and more

than one half of the county was infested. The first weevils actually found in this county were taken three miles east of Mt. Olive by Mr. W. D. Pierce, of the Bureau of Entomology, on October 13, 1909. On November 5, 1909, the writer found weevils at Seminary, Mississippi. During 1910 the entire county will undoubtedly be infested, but by forcing the cotton to early maturity the boll weevils may not be serious pests next year.

Forest County.—The first boll weevils probably reached this county early in October, 1909. On October 14, 1909, Mr. W. D. Pierce found them near the county line at Clyde in Lamar county and two days later he found them three miles west of Brooklyn and two miles west of Maxie. On November 1, 1909, the writer found weevils at Rawles Springs and Mammoth Springs in the northwest corner of the county and the next day found that they had spread entirely across the southern half of the county. Although careful search was made in the vicinity of Hattiesburg no boll weevils were found, and it is probable that the northeastern portion of this county was not infested during 1909; the entire county, however, will probably become infested during 1910. The boll weevils reached Forest county too late to cause noticeable injury in 1909.

Franklin County.—This county probably received its first weevils early in August, 1908, but by the end of September, 1908, the entire county was within the infested area. However, the effect of the pest was hardly noticeable the first year as more bales of cotton were produced in 1908 than in any of the three preceding years. The first weevils actually taken in this county were obtained by Mr. C. W. Flynn, of the United States Bureau of Entomology, at Roxie, on September 5, 1908.

Greene County.—This county on the eastern border of the state probably received its first boll weevils during October, 1909. The writer found weevils in all stages about three miles south of Merrill and also in the vicinity of Denny, on November 3, 1909. There is very little cotton growing in this region and this fact probably accounts for the spread of the insect across this county and the counties immediately west. It is not known how far north the infestation occurs in this county, but probably not north of the Mobile, Jackson & Kansas City Railroad.

Hancock County.—There is very little cotton growing in this county; and, so far as the writer is aware, no boll weevils have been taken in

the county. They were, however, very abundant at the Branch Experiment Station at McNeill, in Pearl River county.

Harrison County.—The first boll weevils actually found in this county were taken by Mr. C. E. Hood, of the United States Bureau of Entomology, around Wiggins, and nine miles east of Wiggins on November 8, 1909. Some days before this the writer had found boll weevils in all stages east of this in Jackson county, so there is little doubt that the weevils had reached Harrison county by October 1, 1909. The small amount of cotton grown in this county caused them to go eastward very rapidly in the search for food.

Hinds County.—The first boll weevils reaching this county probably arrived late in August, 1908. Our first accurate record is from Edwards where Mr. C. W. Flynn, of the Bureau of Entomology, found weevils on September 8, 1908. Correspondents sent boll weevils to the writer during October and November, 1908, from around Utica. By the time frost had checked their spread a considerable portion of southwestern Hinds county had been infested. The weevils reached this county too late to do serious damage in 1908 and were not numerous enough to be very serious in 1909. The poor crops in some sections of the county were due more to adverse weather conditions than to any insect injury. The line of infestation for 1908 extended from near Edwards in a southeasterly direction to Oakley, and then on to a point west of Terry.

One of the two isolated infestations found in 1908 considerably ahead of the line of general infestation occurred in this county just on the outskirts of Jackson. The weevils had probably been brought there accidentally from boll weevil infested territory. They were first found, I believe, by Commissioner of Agriculture, H. E. Blakeslee, and later by Mr. B. L. Moss, Special Agent of the Bureau of Plant Industry. On October 28 and 31, 1908, Mr. R. A. Cushman and Mr. W. D. Pierce, of the Bureau of Entomology, found weevils in this field. It was thought that the weevils had been there for some weeks, and it was feared that they would spread from this field during 1909. However, no more weevils were found around Jackson until September, 1909, although all of the nearby cotton fields were carefully searched during July and August of this year. There is little doubt that this infestation was completely killed out during the winter.

On September 26, 1909, Mr. B. L. Moss found boll weevils at Jackson. The entire county was probably infested before frost checked their movement.

Issaquena County.—The first weevils recorded from this county were sent to the writer by a correspondent from Fidler on June 14, 1909. The fact that adult weevils were found so early in the season proves that the weevils had reached this county sometime during the fall of 1908. The entire county was infested before September 1, 1909.

Jackson County.—This county marks the eastern extremity of the spread of the boll weevil for 1909. It is possible that some of the insects reached Alabama late in November, but none have been recorded. On November 3, 1909, the writer found many weevils in cotton fields between Crossroads and Denny in the northern part of the county and they were apparently more numerous towards the south. They had reached this county too late to do serious injury but practically the whole county is now undoubtedly infested.

Jefferson County.—This was the third county infested. Although no weevils were received during 1907 it is probable that they reached the western part of the county late in the year. During 1908 the entire county was infested but the damage caused by the boll weevil was slight as the county produced almost an average cotton crop. The first weevils recorded from this county were taken by Mr. C. W. Flynn of the Bureau of Entomology, on August 19, 1908, at Harriston.

Jefferson Davis County.—The boll weevil probably first reached this county about September 1, 1909, but by the end of the month the entire county was within the infested area. The first weevils recorded were taken by the writer at Bassfield on November 18, 1909, but a month previous to this they had been found in counties east of here. The pest reached this county too late to do serious damage during the season of 1909.

Jones County.—During October, 1909, the boll weevil line reached the extreme southwestern corner of this county. On November 1, 1909, the writer found one boll weevil in a cotton field near the Gulf & Ship Island Railroad, southeast of Lux. They did no damage in Jones county during 1909 but the entire county will probably be infested during 1910.

Lamar County.—The entire county probably became infested during September and October, 1909. On October 14 and 15, 1909, Mr. W. D. Pierce found weevils at two points in the eastern part of the county. They reached here too late to do serious damage in 1909. The small amount of cotton grown in this county accounts for the rapid movement of the insects across the county.

Lawrence County.—The first weevils reached this county in August, 1909, but by the end of September the entire county was within the infested area. The first boll weevils received from this county were sent to the writer from a correspondent in Monticello, on September 8, 1909.

Lincoln County.—The first weevils recorded from this county were taken by Mr. C. W. Flynn two miles east of Lucien on September 12, 1908. Before frost the weevils had spread over more than half of the county and Mr. W. D. Pierce found them at Brookhaven on October 28, 1908. They were too late to do any serious damage in Lincoln county in 1908 as the cotton production was considerably greater this year than in any of the three preceding years. During August, 1909, the weevils had covered the entire county.

Madison County.—The first boll weevils recorded from this county were taken by the writer at Adelle on October 18, 1909. Before frost had checked their movement they had probably reached as far east as the Y. & M. V. R. R. They reached this county too late to do any damage during 1909.

Marion County.—The boll weevils probably spread entirely over this county during September, 1909, although not in large enough numbers to do serious damage. There is not much cotton grown here which accounts largely for their rapid movement in this section. The first weevils recorded from this county were taken by Mr. W. D. Pierce near Columbia on September 16, 1909.

Pearl River County.—The boll weevils first reached here in September, 1909, but because of the small amount of cotton grown here they crossed the county within a month. The first record of weevils from this county was made by Mr. W. D. Pierce and Prof. E. B. Ferris at McNeill on October 15, 1909.

Perry County.—The first boll weevils to reach this county probably arrived in October, 1909. On November 2, 1909, the writer found weevils in all stages in the southern part of this county along the road between Brooklyn and Janice. It is not probable that the line of infestation extends north of the M. J. & K. C. R. R. The weevils reached here too late to do any damage in 1909. They will spread throughout the entire county next year.

Pike County.—At the close of the season of 1908 the eastern line of the boll weevil infested territory included a portion of the western part of this county. They reached this county too late to do any

damage as the cotton production of 1908 exceeded that of any of the three previous years. The first weevils from this county were sent in by a correspondent from Summit in November, 1908. Probably by September 1, 1909, the entire county was infested.

Rankin County.—The southwestern corner of this county became partially infested by weevils during October, 1909. Mr. W. D. Pierce found weevils near Cato on October 12, 1909. The entire county will probably become infested next year.

Sharkey County.—The southwestern corner of this county was probably infested by the boll weevil late in 1908. The first boll weevils received from this county were sent in by a correspondent from Rolling Fork on August 11, 1909. Probably the whole county became infested during 1909 although there may still be a small portion in the northeast corner that is not yet infested.

Simpson County.—The first boll weevils reached this county in September, 1909, but too late to do any serious damage this year. Mr. W. D. Pierce found weevils between Braxton and Mendenhall on October 12, 1909. The boll weevils may not have yet reached a portion of the northeastern part of this county but the entire county will be infested next year.

Warren County.—The boll weevils probably first reached this county during August, 1908. The first weevils taken in this county were found by Mr. C. W. Flynn about five miles south of Vicksburg on September 7, 1908. The entire county may have been infested last year. If a portion remained uninfested last year it was reached by weevils before September 1, 1909.

Washington County.—This county was just on the border of the infested area in 1908. It is possible that a few weevils reached here but probably did not survive the winter. The county was considered as infested in 1908 because of the isolated infestations so much farther east in Yazoo and Hinds counties. The first weevils actually recorded from this county were taken by Mr. E. S. Tucker, on October 5, 1909, at Glen Allen. He also found weevils at Greenville on November 4, 1909, and at Hollandale on November 11, 1909. Before the end of the season 1910 the entire county will probably be infested but the insects will not be numerous enough early in the year to do much damage if the cotton can be planted and matured early in 1910.

Wilkinson County.—This was probably the first county in the state to be infested by boll weevils although they were recorded first

from Adams county. The first weevils found in this county were taken by the writer during the first week of October, 1907. They were found along the Mississippi river and within four or five miles of the river from Artonish to Tarbert. Before the end of the season the weevils had spread half way across the county, but their damage amounted to little as the cotton production for the year exceeded that of either of the two preceding years. During 1908 the entire county became infested and the boll weevil undoubtedly did considerable damage, but in spite of the weevil a larger cotton crop was produced than in 1905.

Yazoo County.—One of the two isolated infestations that were found in 1908 considerably ahead of the line of general infestation was found in this county. Mr. H. E. Savely and Mr. H. D. Tate, of the United States Bureau of Plant Industry, found boll weevils in a cotton field near Roadside, on October 27, 1908. On November 2, 1908, Mr. W. D. Pierce, of the United States Bureau of Entomology, visited this field and found the weevils. He thinks that it was an accidental introduction due to the movement of materials from the infested territory into this county. During 1909 no cotton was grown upon the infested field. Mr. W. D. Pierce and the writer visited the nearby cotton fields during August and September, 1909, but found no signs of boll weevils. The weevils of 1908 had undoubtedly died out during the winter or had been unable to find cotton fields in the spring.

The line of infestation did not reach Yazoo county so far as we know until August, 1909. On August 28, 1909, the writer received boll weevils from a correspondent at Satartia. By the time frost had checked their spread the weevils had reached Yazoo City, and probably a few of them had crossed the Yazoo and Mississippi Valley Railroad south of Yazoo city. The boll weevils caused little damage in this county during 1909, but will probably spread entirely across the county during 1910 and may be numerous enough in the southwestern part of the county to do considerable damage.

METHODS OF CONTROLLING THE BOLL WEEVIL.

No one has discovered any panacea for the boll weevil and it is not likely that any will be discovered. However, years of experience and careful study have brought to light many facts in regard to the life history and habits of this insect. By taking advantage of some of these much can be done to lessen the damage of the boll weevil. We have the benefit of the experience of Texas and Louisiana and

should not be slow to profit by it. It is absolutely essential that every grower of cotton have an intelligent idea of the habits of this insect. Make sure that you are acquainted with the different stages of its life history. Read carefully all available bulletins or publications concerning this insect and verify the statements in these publications for yourself. Make observations for yourself as to which fields are most seriously damaged by the boll weevil, and try to determine the cause for any difference upon fields in the same neighborhood. Test different varieties of cotton under the same conditions so as to obtain the variety that does best on your farm under boll weevil conditions. Observe carefully the effects of early and late planting. There are hundreds of facts concerning the boll weevil that each farmer should find out for himself in order to more intelligently meet the situation and to continue to raise cotton on a profitable basis. It is our purpose to mention some of the most important practices that should be followed by all who expect to raise cotton in boll weevil infested territory. They are not necessarily remedies that will kill the boll weevil but are as a general thing good farm practices that will add to the production of cotton under any condition.

Destroy the stalks early in the fall.—The leading authorities upon the boll weevil all agree that this is the one most important step in the control of this insect. As soon as the boll weevils become so numerous that practically no more cotton will be produced, destroy the stalks so as to kill many of the insects and to cut off the food supply of the others. One can usually tell at a glance when a field has become badly infested by the fact that very few blossoms are to be seen. Hasten the picking of the cotton and as soon as it is picked out destroy the stalks. The earlier the cotton stalks are destroyed the fewer weevils will survive to damage the crop next year.

Mr. Wilmon Newell, Secretary of the Louisiana State Crop Pest Commission, carried on some very valuable experiments in 1908, that clearly show the value of the early fall destruction of the cotton plants. I shall quote freely from circular No. 28 of the Louisiana State Crop Pest Commission, in which Mr. Newell gives a summary of these experiments. He found that where the plants were destroyed before October 15, only 3 per cent of the weevils survived the winter to infest the next year's crop. Where the cotton plants were destroyed between October 15 and October 27, about 15 per cent of the weevils survived the winter. Where the cotton plants were destroyed between November 1 and November 25, about 22 per cent of the weevils survived. Where the cotton plants were destroyed between Novem-

ber 25 and December 7, 28 per cent of the weevils lived through the winter, but where the destruction of the cotton plants was put off until the middle of December or later over 43 per cent of the boll weevils survived the winter and were ready to attack the next year's crop.

"These figures are so convincing that it is incomprehensible that any farmer should continue to try to grow cotton without picking out his crop early and completely destroying the cotton plants—stalks, leaves, bolls and roots—long before the first autumn frost."

"Destruction of the cotton plants before October 15th, in this instance, allowed but 3 per cent of the weevils to live until the crop of 1909 was subject to their attack. Against this small number of overwintered weevils, as has been repeatedly proved by experience, the planter can make a good crop by the use of proper early-maturing varieties, and by the adoption of the intensive cultural methods. By leaving the cotton plants standing until after the middle of December last fall the farmer invited certain destruction of this year's crop, for when he starts the spring with 43 per cent as many weevils as he had the previous fall he cannot hope to make a crop by any known means under the sun."

"Arguments are still being made against early fall destruction of the cotton plants by those who steadfastly refuse to see the plain facts placed before them, but the farmers who **are** destroying the cotton plants early in the fall are making money growing cotton, and the fact remains despite all argument, that there is no other way in which a paying crop of cotton can be made under the conditions as they now exist in Louisiana and as they will exist for many years to come."

"Strangely enough, there are farmers who still argue that they cannot pick out the crop early enough to destroy the cotton plants by October 15th to November 1st. The alternative is to have no cotton to pick out. Those who cannot so arrange their farm management as to follow our recommendation in this regard are simply advised not to grow cotton at all, for unless the weevils are destroyed—by destroying the cotton plants—early in the fall, a profitable crop is impossible."

"Do not wait for sad experience to drive this lesson home to you. If you intend to grow cotton next year make all preparations now to pick out this year's crop as fast as it opens and destroy all cotton plants by cutting them down and burning them before October 15th or, at the latest, November 1st."

There are several methods by which the stalks may be destroyed, (1) by burning, (2) by cutting and plowing under, and (3) by pasturing. We shall discuss each of these methods.

(1) **Burning the stalks:** Plow the stalks up, then rake them into windrows and as soon as they are dry burn them. Cutting instead of plowing up the stalks is about as good a plan if the ground is plowed soon afterwards so as to make sure that no sprouts of cotton will start up from the old roots. Be careful to burn all of the cotton plants as hundreds of weevils may be kept alive on a few stalks. Do not allow the fire to spread as the burning of plants of any kind is a very bad agricultural practice. The soil is robbed of an immense amount of fertility every year by the burning over of our lands in Mississippi. Many good agricultural authorities even doubt the advisability of recommending the burning of the cotton stalks as they claim that in time the burning off of this fertility will do more damage than the boll weevil. However, there is no method so sure of destroying immense numbers of weevils and consequently lessening their damage the next year as the early burning of the stalks. Burning the cotton stalks destroys the weevils in several ways. Many adult weevils are killed, many eggs and larvae within the squares and bolls are killed; no weevils are produced late in the fall to be strong to live through the winter; the adults that are not burned will have no food and will be so weakened when winter comes that they cannot survive until spring.

(2). **Cutting and plowing under:** As early as possible go through the fields with a stalk cutter and then follow with a plow. This method has the advantage of not robbing the soil of any fertility, but on the other hand not so many boll weevils are killed as by burning the stalks. Many of the immature weevils in the squares and bolls will have opportunity to mature. However, if the plants are well covered with soil a large proportion of these weevils that would mature will probably never reach the surface, and the adult weevils would be entirely without food and would be so weakened as not to be able to live through the winter. The success of this method depends largely upon the earliness and thoroughness with which it is done.

(3) **Pasturing:** The writer has seen small cotton fields in Mississippi into which cattle had been turned early in October that were without a vestige of foliage by the end of that month. Under such conditions considerable benefit was undoubtedly derived from this method but there is always opportunity for the plants to sprout and



EARLY Versus LATE PLANTING IN THE CONTROL OF THE BOLL WEEVIL.

FIG. 10. The upper illustration shows a cotton field planted late and yielding nothing. The lower illustration shows a field on the opposite side of the turnrow on same plantation, planted early, properly treated, and yielding three-quarters of a bale per acre. (Hunter, Yearbook, U. S. Dept. of Agr., 1906.)

furnish food for the weevils. This method is not as thorough as either of the others and its use is of course very limited. There are comparatively few farms on which there are enough live stock to do much good. If the fields are ready for cattle to be turned into them they are also ready for the stalk cutter and the latter will do the work much faster. However, this method is recommended when on account of lack of labor or for other reasons it is impossible to destroy the stalks in any other manner.

Plant on well drained land.—It is absolutely essential to do everything possible to mature the cotton crop early in weevil infested territory. Poorly drained land cannot be made to mature cotton early. Some people assert that well drained lands will solve the boll weevil problem. Choose the best drained fields in which to plant cotton and do everything possible to improve the drainage of all the fields.

Plant early.—In order to get ahead of the boll weevil, that is to have the cotton crop mature before the boll weevils become numerous enough to destroy most of the squares and bolls, it is of course necessary to plant as soon as the soil is in proper condition. No definite date can be given for planting in any locality but plant as soon as the soil is in good shape and the weather is warm enough—the earlier the better.

Varieties of cotton to plant.—The best variety of cotton to plant under ordinary conditions may not be the best for boll weevil conditions. One must, of course, always keep in mind the productiveness and the other desired qualities of the cotton but it is very essential that an early maturing variety be used. That does not necessarily mean a variety that begins to blossom early but it means a variety that will produce the largest quantity of cotton at the earliest date. Other things being equal, early maturing is the most important factor to be considered.

A second matter to consider is the thickness of the “pods” or “husks” of the cotton boll. The varieties with thick pods have been found to withstand the attacks of the boll weevil better than other varieties. Therefore, try to choose a variety with a thick husk or pod. Other things being equal the thicker the pod the better.

A third matter to be considered in selecting a variety of cotton for boll weevil conditions is in regard to the rankness of the growth or the amount of foliage and consequent amount of shade produced. A rank growing variety with an abundance of foliage is not desirable for planting under weevil conditions. The shade prevents the

sun from reaching the ground under the plants where the fallen squares infested with boll weevil larvae are lying. If the sun is allowed to reach these squares, many of the weevils are killed by the heat. It takes but a small amount of observation of cotton fields in boll weevil infested territory to impress upon one the fact that the tall, rank growing, heavily foliated plants are not desirable. These plants may do very well without the boll weevil but in the presence of this pest the yield from such plants is usually small.

Preparation of the soil.—Above all else the soil must be prepared so that the seed may be planted at the first opportunity. The early fall destruction of the stalks has cleared the fields so that there is little reason for delay. Deep plowing is to be recommended in the preparation of the soil, but after the plants are up shallow cultivation should be practiced.

Fertilizers.—Experiments have shown that commercial fertilizers containing a high percentage of phosphoric acid generally hasten the maturity of the cotton plant. There are many soils that need this element to increase their fertility but with the advent of the boll weevil many soils in which the cotton does not mature early may be benefitted by the use of phosphates. It will pay each farmer to experiment in his own fields to find out just what benefit may be derived from the use of phosphates. Any fertilizer that will hasten the maturity of the plants should be used.

Cultivation.—The frequent and careful cultivation of cotton is even more essential under boll weevil conditions than otherwise. Frequent shallow cultivations should be the practice. Deep plowing is to be recommended in the preparation of the soil but after the plants are up the cultivation should be shallow and care should be always taken not to cultivate too close to the plants. The cutting off of the roots by deep or close cultivation causes the bolls to shed.

Dr. W. E. Hinds, now Entomologist of the Alabama Experiment Station, several years ago devised what is known as a chain cultivator. This is a V-shaped instrument that is drawn along the ground between the rows for the purpose of bringing the fallen squares and bolls from under the plants to the middle of the rows where the sun can reach them and the weevil larvae within them will be killed by the heat. It has been found that this chain cultivator makes a very good dust mulch and therefore performs a double function.

The practice of "laying-by" the crop should be discouraged in every possible way. Throwing the dirt from the middle of the rows

leaves hard surfaces from which the moisture evaporates very rapidly and consequently causes serious loss to the plants. It should be the endeavor of every cotton grower to keep a shallow dust mulch around the plants throughout the entire growing season. This can only be done by frequent and shallow cultivation.

Wide rows.—It has been shown that a great many of the infested bolls and squares fall to the ground. If the rows are wide so that the sun is allowed to reach these fallen squares and bolls, a large proportion of the boll weevil larvae will be killed. The practice of planting in wide rows is therefore most highly recommended. Another reason for wide rows is to give the plants plenty of room. Where they are not crowded the plants will mature earlier and this is an advantage where the boll weevil is present.

Pick the cotton early.—After the cotton has been matured early, do not waste any time in having it picked out. It is never desirable to have more cotton under boll weevil conditions than can be picked out by November 1. As soon as the cotton is gathered follow the previous advice of destroying the stalks at once.

Rotate crops.—As a general proposition it may be stated that weevils never do as much damage where proper methods of rotation are followed as where cotton is grown on the same fields year after year. It is a good practice to plant cotton each year in fields that are as far away from the previous year's cotton fields as possible. The advantages to be derived from the rotation of crops are too numerous and too well known to need any discussion here but to these advantages may be added the fact that the practice assists in lessening the damage of the boll weevil.

Hand picking.—To a limited extent it may sometimes pay to have the weevils picked off during the early part of the season. Each weevil living in the early part of the season may be the ancestor of millions of weevils before frost. Where very cheap labor is available or where children may be employed it may pay to collect and destroy the adult weevils found upon the plants in the early part of the season. The infested squares should not be destroyed but should be placed in wire cages. A 16-mesh wire should be used (that is, there should be 16 meshes to an inch). If this sort of cage is used the parasites of the boll weevil may escape but most of the boll weevils will be held in.

Use of poisons.—Many supposed remedies and poisons for the boll weevil have been proposed but careful investigation has shown

that none of them are practical with the single exception of arsenate of lead. Paris green has been advocated but many tests have shown that although the Paris green will kill many weevils it injures the plants to such an extent as to cause smaller yields of cotton on the poisoned fields than on those not poisoned. In Louisiana Mr. Wilmon Newell and Mr. G. D. Smith have carried on many experiments with arsenate of lead. This substance promises to be of great assistance in controlling the boll weevil. It should be applied in the powdered form during the early part of the season so as to kill the first weevils that appear upon the plants. Several applications are recommended about the time the first buds appear—using 2 to 2½ pounds per acre when the plants are small but increasing this to 6 or 8 pounds when the plants become larger. Although the prospects are very bright for this substance becoming of great assistance to us in the future I should not advise anyone to use arsenate of lead who has not learned just how and when to apply it. The writer will be glad to hear from any people in this state who may wish to test this substance and will render them all possible assistance.

WEEVILS MISTAKEN FOR THE BOLL WEEVIL.

Thousands of people in this state have seen pictures of the boll weevil (figure 11). Many do not realize that there are other insects that resemble the boll weevil considerably in appearance and as a consequence whenever they see a weevil of any kind they feel confident that it is a boll weevil. The zeal with which many people have searched for the boll weevil is greatly to be commended. This zeal has been shown by the large number of insects that have been sent to us for identification. Almost all of the insects commonly found upon



FIG. 11. Boll weevil, *Anthonomus grandis* Boh. (Hunter and Hinds, Bul. 51. Bur. of Ent. U. S. Dept. of Agr.)

cotton have been sent in as well as hundreds of other insects somewhat resembling the boll weevil although not found upon cotton. The boll weevil is at least teaching the people to observe and many are learning about other insects which they had previously never noticed although they had passed them by for years. We are giving illustrations and short descriptions concerning some of the insects

that have been sent to us most often during the past year. The illustrations will generally show the difference between these insects and the boll weevil plainly enough so that the average farmer can distinguish them by comparing any insects that may be found with the illustrations.

Cocklebur weevil or Transverse baris (*Baris transversa* Say)—(Figure 12).—They are only known to feed within the roots and stalks of the cocklebur and in order to give them a name that may mean more to the average person we have been calling them "cocklebur weevils." These insects have been sent to us more frequently than any other one species. They have been received from all sections of the state from November until July, but particularly during the winter months. The eggs are probably laid within the stalk of the cocklebur early in the summer. During the late summer the grubs may be found within

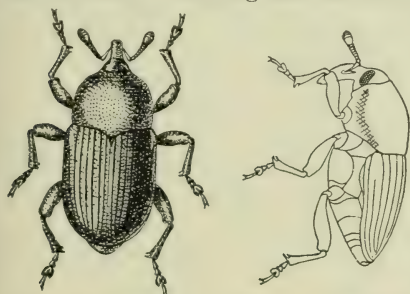


FIG. 12.—Cocklebur weevil or Transverse baris, *Baris transversa* Say. (Hunter and Hinds, Bul. 51, Bur. of Ent., U. S. Dept. of Agr.)

the stalks of these plants. They transform early in the fall as from November until spring the adult weevils may be found usually within the stalks just at the surface of the ground. The weevils are black in color, smaller and more rounded than the boll weevil. The adults are found most commonly at the time of the year when the boll weevils are very scarce.

Cowpea-pod weevil (*Chalcodermus aeneus* Boh.)—(Fig. 13).—During the summer months especially in the late summer and early fall great numbers of these weevils were received. They are about the size of the boll weevil but somewhat rounder in shape and of a jet black color. They breed in the pods of the cowpea and where cotton follows cowpeas they have been known to damage the young cotton plants just as they are coming up. However, it is rare for these insects to do any damage to cotton and they probably never do any noticeable injury to cotton after it is a month old.



FIG. 13. Cowpea-pod weevil, *Chalcodermus aeneus* Boh. (Chittenden, Bul. 44, Bur. of Ent., U. S. Dept. of Agr.)



FIG. 14. White-pine weevil.
Pissodes strobi Peck. (Hop-
kins. Cir. 90 Bur. of Ent.,
U. S. Dept. of Agr.)

White pine weevil (*Pissodes strobi* Peck.)—(Fig. 14).—As the name suggests this weevil probably confines its attacks to pine trees, often causing serious injury and sometimes hastening the death of the trees. They breed in the twigs and in the bark of the pine, and, as this tree is widely distributed, these insects have been received from many sections of the state. They are somewhat larger than the boll weevil, reddish brown in color with white spots on the posterior end of the wing covers.

Bloodweed weevil (*Lixus* sp.)—(Fig. 15).—These long slender weevils have been received at all seasons of the year. They are usually at least twice as long as the boll weevil and differ from it very much in shape. The snout is much shorter in proportion to the size of the body. These weevils may often be found by cutting open stalks of bloodweed or ragweed. There are several species that resemble each other very much in appearance but differ considerably in their habits.



FIG. 15.—Blood weed weevil.
Lixus sp. (Hunter and Hinds,
Bul. 51, Bur. of Ent., U. S.
Dept. of Agr.)



FIG. 16. Acorn weevil, *Balaninus victoriensis* Chit. (Chittenden, Bul. 44, Bur.
of Ent., U. S. Dept. of Agr.)

Acorn weevil (*Balaninus victoriensis* Chit.)—(Fig. 16).—This is one of the nut weevils. They all resemble each other very much in appearance but differ considerably in size and in food habits, although they all feed upon nuts. The chestnut and the hickory weevils are probably not quite so numerous in this state as the acorn weevils. In ap-

pearance these insects resemble the boll weevil very much. They are usually somewhat larger and of a lighter color. As nut trees are often growing near cotton fields it is not strange that these insects are sometimes found upon cotton plants, but there are no records to show that they ever injure these plants. The nut weevils are frequently attracted to lights and it is not uncommon for these insects to come into houses at night on that account.

Ironweed weevil (*Desmoris scapalis* Lec.)—(Fig. 17).—This weevil resembles the boll weevil very much but has a more pointed appearance and has not the conspicuous spines on the fore legs that the boll weevils have.

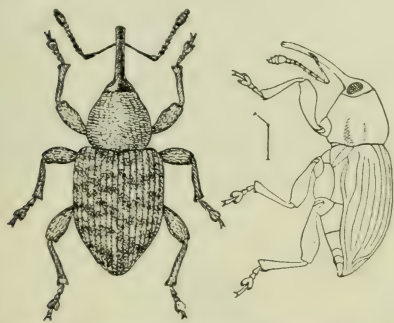


FIG. 17.—Ironweed weevil, *Desmoris scapalis* Lec. (Chittenden, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)



FIG. 18.—Pepper weevil, *Anthonomus aeneotinctus* Champ. (Hunter and Hinds, Bul. 51, Bur. of Ent., U. S. Dept. of Agr.)

Pepper weevil (*Anthonomus aeneotinctus* Champ.)—(Fig. 18).—This weevil is somewhat smaller than the boll weevil. It feeds upon peppers. Although this weevil has not been sent to us from this state it is likely to reach us at any time and is of some economic importance besides being mistaken for the boll weevil.

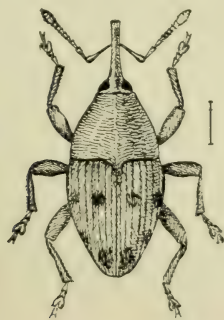


FIG. 19.—Flower weevil, (*Centrinus penicellus* Hbst. (Hunter and Hinds, Bul. 51, Bureau of Ent., U. S. Dept. of Agr.)

Flower weevils (*Centrinus* spp.)—(Fig. 19).—Often in the blossoms of cotton and many other plants small weevils are found that resemble the boll weevil very much in appearance. These are generally feeding upon pollen and nectar and are not known to injure cultivated crops. Most of these weevil are smaller than the boll weevil but some of them are just about the same size. As the adult boll weevils are also often found in the cotton blossoms it is not surprising that these flower weevils are mistaken for them.



FIG. 20. Plum-gouger, *Anthonomus scutellaris* Lec.
(Insect Life.)

Plum gouger (*Anthonomus scutellaris* Lec.)
—(Fig. 20).—This is a well known pest to plums and apples. It is not known to injure cotton. In size it resembles the boll weevil considerably. It is occasionally mistaken for the boll weevil.

Coffee-bean weevil (*Araecerus fasciculatus* De G.)—(Fig. 21).—These weevils have been observed often in the southern half of the state but are probably to be found in all sections. The writer has found them breeding in partly decayed cotton bolls that have been injured by the pink boll rot of cotton (*anthracnose*). So far as is known these insects do not damage the living bolls. They are really scavengers and feed upon the dry or decaying bolls. There is no other insect that is more likely to be confused with the larva or grub stage

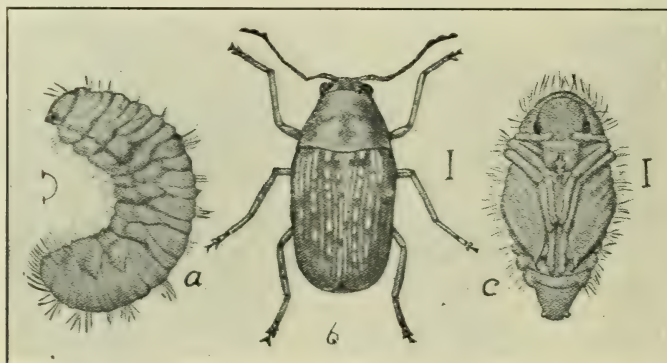


FIG. 21. Coffee-bean weevil, *Araecerus fasciculatus* De G: a, larva; b, adult beetle; c, pupa, enlarged. (Chittenden, Bul. 8, Div. of Ent., U. S. Dept. of Agr.

of the boll weevil than this species. The boll weevil larva feeds only in living "squares" and bolls but the coffee-bean weevil is not known to attack any but the dried or decaying bolls. Another difference so far as the writer's observations go is that the larvae of this species (Fig. a) are pink while the boll weevil larvae are white, but according to Mr. E. S. Tucker, who has probably studied this species more than any one else, the larvae are also generally pure white. Besides breeding in dried cotton bolls the coffee-bean weevils breed, as the name suggests, in aromatic beans and also in corn stalks and dried fruits. They have also been known to damage growing corn stalks. The

adults (Fig. b) also resemble the boll weevils considerably upon a superficial examination and are found upon the old diseased bolls.



FIG. 22. Corn bill-bug. *Sphenophorus* sp. (Original.)

Corn bill bugs (*Sphenophorus* sps.) — (Fig. 22). — Although these insects are often injurious to corn they are not known to damage cotton. They are most likely to injure corn that has been planted in marsh land by feeding upon the stems and leaves. They are usually larger than the boll weevil and have a rough appearance and the body is usually dirt colored. These insects have been sent to us from all sections of the state and are likely to be found at any time of the year.

Imbricated snout beetle (*Epicaerus imbricatus* Say) — (Fig. 23). — This species may easily be distinguished from the boll weevil by its short broad snout and by the stripes across its wing covers. These snout beetles are general feeders and have been known to damage a great many different kinds of plants but they are not known to damage cotton.



FIG. 23. Imbricated snout beetle, *Epicaerus imbricatus* Say. (Chittenden, Bul. 19, N. S., Div. of Ent., U. S. Dept. of Agr.)

Other weevils or snout beetles.—Many other snout beetles are often mistaken for the boll weevil. Several of these should be mentioned, although they are not illustrated in this bulletin, as they are much oftener found than some of the weevils mentioned above.

Pine bark weevil (*Pachylobius picivorus* Germ.)—This large weevil has been frequently sent to us during the winter and early spring months. The larvae or grubs feed under the bark of pine stumps and recently felled trees. They may also sometimes attack dying pine trees that are still standing and undoubtedly hasten the death of the trees. The adult weevils are several times as large as the boll weevil but vary considerably in size as well as color. They are often nearly

jet black but sometimes brownish and often have whitish spots. They always have a resinous appearance.

Plum curculio (*Conotrachelus nenuphar* Hbst.)—This well known pest is occasionally mistaken for a boll weevil. Although it is the worst pest attacking peaches and plums in this state, it is perfectly harmless so far as cotton is concerned. It does not resemble the boll weevil enough to confuse anyone who will take time to compare the insect with a picture of the boll weevil. They are about the same size and they both have the snout, like all other weevils, but the plum curculio has a rough appearance that should easily distinguish it from the boll weevil.

Grain weevils (*Calandra* sps.)—These small brownish black weevils that attack corn, rice, and other stored grain are much smaller than the boll weevil. Although they are very serious pests injuring stored grains they do no damage to cotton. They are so well known that it is seldom they are mistaken for boll weevils.

OTHER INSECTS MISTAKEN FOR BOLL WEEVILS.

Besides the true weevils or snout beetles that resemble the boll weevil considerably in structure there are many other insects often mistaken for the boll weevil. These have not the slightest resemblance to the boll weevil and the only excuse for their being mistaken for it is the fact that they are found upon cotton.

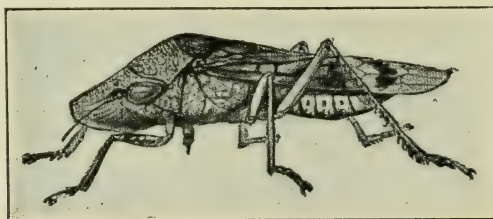


FIG. 24. Cotton sharpshooter, *Homalodisca triquetra* Fab. (Insect Life.)

Cotton sharpshooter (*Homalodisca triquetra* Fab.)—(Fig. 24).—These insects as well as several other sharpshooters often occur on cotton and many times have been mistaken for boll weevils. These insects are not even beetles and would probably never be mistaken for boll weevils by people who have ever seen pictures of this pest. The sharpshooters are said to sometimes do considerable damage by puncturing the bolls, squares, and young growth. They have sucking mouth parts with which they pierce the tissues of the plants and suck out



FIG. 25. Cotton stainer, *Dysdercus suturellus*, H. Sch. (Insect Life.)

the sap. These insects are very active; when a person approaches a plant upon which they are at work they will either fly away or move to the opposite side of the twig so as to be out of sight. The sharpshooters are found on many other plants besides cotton.

The cotton stainer (*Dysdercus suturellus* H-Sch.) — (Fig. 25).— These insects are often known locally as “red bugs.” They are sometimes found upon cotton and are said to damage the plants by piercing the stems and bolls and sucking out the juices and also by staining the cotton in the open bolls. In this state these insects have not been often confused with the boll weevil.

Click beetles, or snapping beetles (Fig. 26).—These rather long flat beetles are well known to most people. They receive their names because when placed upon their backs they will “snap” into the air. Also when held against a flat surface they will “snap” or “click”, as it is often called, by raising the fore part of the body and bringing it suddenly against the surface. These beetles are often found in cotton bolls that have been partially destroyed by boll worms. It is not thought that they do any damage to cotton but people finding them upon cotton plants sometimes mistake them for boll weevils. The larvae of these click-beetles are wire-worms and often do much damage to the roots of plants.

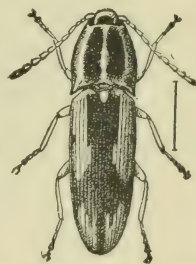


FIG. 26.—Click beetle *Monocrepidius vespertinus* Fab. (Chittenden, Bul. 51, Bur. of Ent., U. S. Dept. of Agr.)

Cotton stalk-borer (*Alaxia crypta* Say)—(Fig. 27).—This beetle is not known to be of any particular economic value and the writer has never found it in this state. However, it undoubtedly occurs in all parts of Mississippi and is probably sometimes mistaken for the boll weevil. The writer has talked to several cotton planters who insist that the boll weevil larvae sometimes feed within the stalks of the cotton-plants. These men have undoubtedly seen the larvae of this

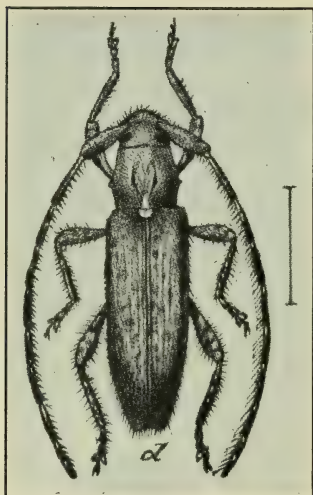


FIG. 27.—Cotton-stalk borer. *Ataxia crypta* Say. (Howard Bul. 33, Office of Expt. Stations, U. S. Dept. of Agr.)

beetle and have mistaken them for boll weevils as the latter are not known to ever feed within the stalks.

Euphoria beetles (*Euphoria* sp.)—(Fig. 28).—These large beetles shown in the illustration considerably enlarged and also natural size, are often found feeding upon decaying bolls. The writer has observed these insects upon cotton very often but has never found that they do any injury. They usually follow the boll worm or some other insect that has partially eaten the boll. The Euphoria beetles are much larger than the boll weevils and have very slight resemblance to them yet they have often been sent to us by

Southern corn-root worm (*Diabrotica 12-punctata* Oliv.).

—This is the “bud-worm,” “drill-worm,” or “spiker,” that is such a serious pest to young corn while in the grub or larva stage. In the adult stage it is a yellowish-green beetle with 12 black spots on its wing covers. During the summer and fall beetles are very common in cotton blossoms and upon the leaves. They probably feed largely upon the pollen and nectar of flowers but may do some damage by feeding upon leaves.

They are often mistaken for the boll weevil but the great difference in color ought to distinguish them at a glance.

The soldier beetles (*Chauliognathus pennsylvanicus* De G. and *marginatus* Fab.).—These beetles are very similar to the “fire-flies”



FIG. 28. Euphoria beetle, *Euphoria* sp. (Original.)

or "lightning-bugs"; they have soft bodies and are yellow and black in color. The beetles are found around and within the blossoms and upon the leaves of many plants. After observing many of these beetles upon cotton in all parts of the state, the writer does not believe that they ever cause any injury. Careful search through the entomological literature at his disposal also fails to show that any other observers report these beetles as being injurious. They feed largely upon the pollen and nectar. During the season of 1909 they were often thought to be the cause of "shedding of the bolls." However, they were probably entirely innocent as the unfavorable weather conditions undoubtedly caused this trouble. Instead of being injurious this species should be regarded as beneficial as the larvae are known to destroy many noxious insects.

The dusky plant-bug (*Calocoris rapidus* Say).—Many of the plant bugs are occasionally found upon cotton but this species seems to prefer this plant and is a very common insect in this state. When numerous it probably causes some damage but the writer has never seen plants that appeared to be seriously damaged by this insect. The dusky plant-bug is about half an inch long when full grown, moves very rapidly, and is therefore rather difficult to catch but has a soft body so that it is very easily killed when caught.

The leaf-footed plant-bug (*Leptoglossus phyllopus* Linn.).—This is a large dark colored bug, with a single white stripe running across the back. It has a characteristic disagreeable odor and receives its name because of the flattened appearance of part of its hind-legs. Because of their size these insects probably do some damage when they pierce the forms and bolls, but this is not common. They have occasionally been mistaken for boll weevils.

Boll-worm (*Heliothis obsoleta* Fab.).—This insect has for a number of years probably done more damage to cotton in Mississippi than any other one insect pest. It damages cotton by eating holes through the large bolls and completely devouring the small bolls. It has probably been here as long as cotton has been grown and its work is too well known to need much discussion. It would not be mentioned except that some people have mistaken the injury caused by the boll worm for the work of boll weevils. Usually the boll-worms can be found within the bolls that they are destroying. They differ from boll weevil grubs in having legs and in not being white in color. The boll weevil grubs can not crawl from one boll to another. There is also some confusion in regard to the names, "boll worm" and "boll weevil,"

by people who are not acquainted with them. The boll worm seems to prefer corn to cotton as a food. Many farmers make it a practice to plant some late corn in the vicinity of their cotton fields so as to attract the boll worm moths. They lay their eggs upon the corn plants and when the young boll worms hatch out they will feed upon the corn and the cotton is therefore not injured.

Cotton-worm (*Alabama argillacea* Hbn.).—This insect is often called the "army worm," or "leaf-worm." Twenty years ago it was a very serious pest. At the present time it seldom becomes numerous. Occasionally there are outbreaks late in the season and the plants may be defoliated. This insect is not often confused with the boll weevil but is often confused with the boll worm mentioned above.

PUBLICATIONS.

There has been a great deal published regarding the boll weevil during the past fifteen years. Most of these publications give information concerning the life history, habits, and methods of controlling the boll weevil. This information has practically all been obtained by the entomologists employed by the United States Department of Agriculture and by the states of Texas and Louisiana.

The following publications would be most useful to the people of Mississippi who wish to obtain more information concerning the boll weevil and other cotton insects, or concerning the culture and varieties of cotton. All of these publications are for free distribution except the two for which the price is given. They may be obtained by writing directly to the addresses given.

1905. The Mexican Cotton Boll Weevil, by W. D. Hunter, and W. E. Hinds, Bulletin No. 51, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C. This is probably the most complete work upon the boll weevil. It can be obtained from the Superintendent of Documents, Washington, D. C., for 22 cents, or you may be able to obtain it free by writing to your congressman.
1905. Essential Steps in Securing an Early Crop of Cotton, by R. J. Redding, Farmers Bulletin No. 217, Department of Agriculture, Washington, D. C.
1905. Miscellaneous Cotton Insects in Texas, by E. D. Sanderson, Farmers Bulletin No. 223, U. S. Department of Agriculture, Washington, D. C. (This bulletin discusses other cotton insects but not the boll weevil.)
1907. Some Factors in the Natural Control of the Mexican Cotton Boll Weevil, by W. E. Hinds, Bulletin No. 74, Bureau of Entomology, U. S. Department

of Agriculture, Washington, D. C. (This may be obtained for 18 cents from the Superintendent of Documents, or free from your congressman.)

- 1907. The Most Important Step in the Control of the Boll Weevil**, by W. D. Hunter, Circular No. 95, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.
- 1907. The Cotton Boll-worm**,—a summary of its Life History and Habits with some results of investigations in 1905 and 1906, by F. C. Bishopp and C. R. Jones, Farmers Bulletin No. 290, U. S. Department of Agriculture, Washington, D. C.
- 1908. Cotton Culture in Mississippi**, by W. L. Hutchinson, Bulletin No. 117, Mississippi Agricultural Experiment Station, Agricultural College, Miss.
- 1908. Farmer's Institute Bulletin 1907 and 1908**, by E. R. Lloyd, Bulletin No. 120, Mississippi Agricultural Experiment Station, Agricultural College, Miss. (This bulletin contains articles by Mr. W. D. Hunter, Mr. Wilmon Newell, Mr. R. L. Bennett, and others, and should be in the hands of every farmer in Mississippi.)
- 1909. What Can Be Done in Destroying the Cotton Boll Weevil During the Winter**, by W. D. Hunter, Circular No. 107, Bureau of Entomology, U. S. Department of Agriculture, Washington, D. C.
- 1909. The Boll Weevil Problem, With Special Reference to Means of Reducing Damage**, by W. D. Hunter, Farmer's Bulletin No. 344, U. S. Department of Agriculture, Washington, D. C. (Every cotton planter should obtain this bulletin.)
- 1910. Cotton 1909**, by W. R. Perkins, Bulletin No. 135, Mississippi Agricultural Experiment Station, Agricultural College, Miss.

HOW TO MAIL INSECTS.

Questions regarding insects will always be gladly answered. When possible all communications should be accompanied by specimens with some of their food. Never send insects in a letter, but enclose them in a tight tin, wooden or strong pasteboard box. It is not necessary to leave any holes for breathing. Always write your name and address plainly on the outside of the package. In a letter accompanying the insects tell all you have noticed as to their feeding habits, abundance, first appearance, etc.

Address all communications to

The Entomologist, Agricultural College, Miss.

AVAILABLE BULLETINS AND CIRCULARS.

The following bulletins and circulars of the Station may be had on request:

No.

BULLETINS.

- 73—Texas Fever.
- 83—Report of Work at McNeill Branch Station for 1903.
- 84—Report of Field Work at College Station for 1903.
- 86—Insects Injurious to Pecans.
- 90—San José Scale.
- 91—Inspection and Analyses of Commercial Fertilizers.
- 92—Beef Cattle.
- 93—Peach and Plum Culture.
- 94—Report of Work at McNeill Branch Station for 1905.
- 95—The Dairy Cow.
- 96—Insects and Diseases Liable to be Introduced into Mississippi.
- 98—Varieties of Cotton.
- 99—Fertilizers.
- 100—Farmers' Institute Bulletin, 1906.
- 104—Inspection and Analyses of Cotton-seed Meal.
- 105—Inspection and Analyses of Commercial Fertilizers.
- 106—Report of Work at the Delta Branch Station for 1906.
- 107—Pork Production at the Delta Station.
- 109—The Adornment of Rural School Surroundings.
- 110—Report of Work at the Holly Springs Branch Station for 1907.
- 111—Experiments in Feeding Dairy Cows.
- 112—Silage vs. Hulls and Meal.
- 113—Cotton Experiments, 1907.
- 114—Inspection and Analyses of Cotton-Seed Meal.
- 115—Inspection and Analyses of Commercial Fertilizers.
- 117—Clearing Pine Lands.
- 119—Report of Work at the Delta Branch Station for 1907 and 1908.
- 120—Farmers' Institute Bulletin, 1907 and 1908.
- 121—Experiments in Feeding Beef Steers.
- 122—Report of Work at the Holly Springs Branch Station for 1908.
- 123—Inspection and Analyses of Commercial Feeding Stuffs.
- 124—Pecan Culture.
- 125—Inspection and Analyses of Commercial Feeding Stuffs.
- 126—Inspection and Analyses of Commercial Fertilizers.
- 127—Inspection and Analyses of Cotton-Seed Meal.
- 128—Inspection and Analyses of Cotton-Seed Meal.
- 129—Sugar Cane for Syrup Making.
- 130—Peanuts.
- 131—Snap Beans.
- 132—The Soils of Mississippi.
- 133—The Inspection and Analyses of Commercial Feeding Stuffs.
- 134—Broom Corn.
- 135—Cotton, 1909.
- 136—Feeding Beef Steers on Cotton-Seed Meal, on Pasture.
- 137—Inspection and Analyses of Commercial Feeding Stuffs.
- 138—Inspection and Analyses of Commercial Feeding Stuffs.
- 139—Boll Weevil in Mississippi, 1909.
- 140—Cotton Diseases of Mississippi.
- 141—Control of Diseases of Flowers, Vegetables and Fruits.

No.

CIRCULARS.

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| <ul style="list-style-type: none"> 21—Inspection and Analyses of Commercial Fertilizers. 22—Inspection and Analyses of Commercial Fertilizers. 23—Inspection and Analyses of Commercial Fertilizers. 25—Inspection and Analyses of Commercial Fertilizers. 26—Inspection and Analyses of Commercial Fertilizers. 27—Inspection and Analyses of Commercial Fertilizers. 28—Inspection and Analyses of Commercial Fertilizers. 29—Inspection and Analyses of Commercial Fertilizers. 30—Inspection and Analyses of Commercial Fertilizers. 31—Inspection and Analyses of Commercial Fertilizers. | <ul style="list-style-type: none"> Asparagus. Blackleg. Insect Pest Law. Underground Waters of Mississippi. Boll Weevil. |
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BULLETIN No. 140.

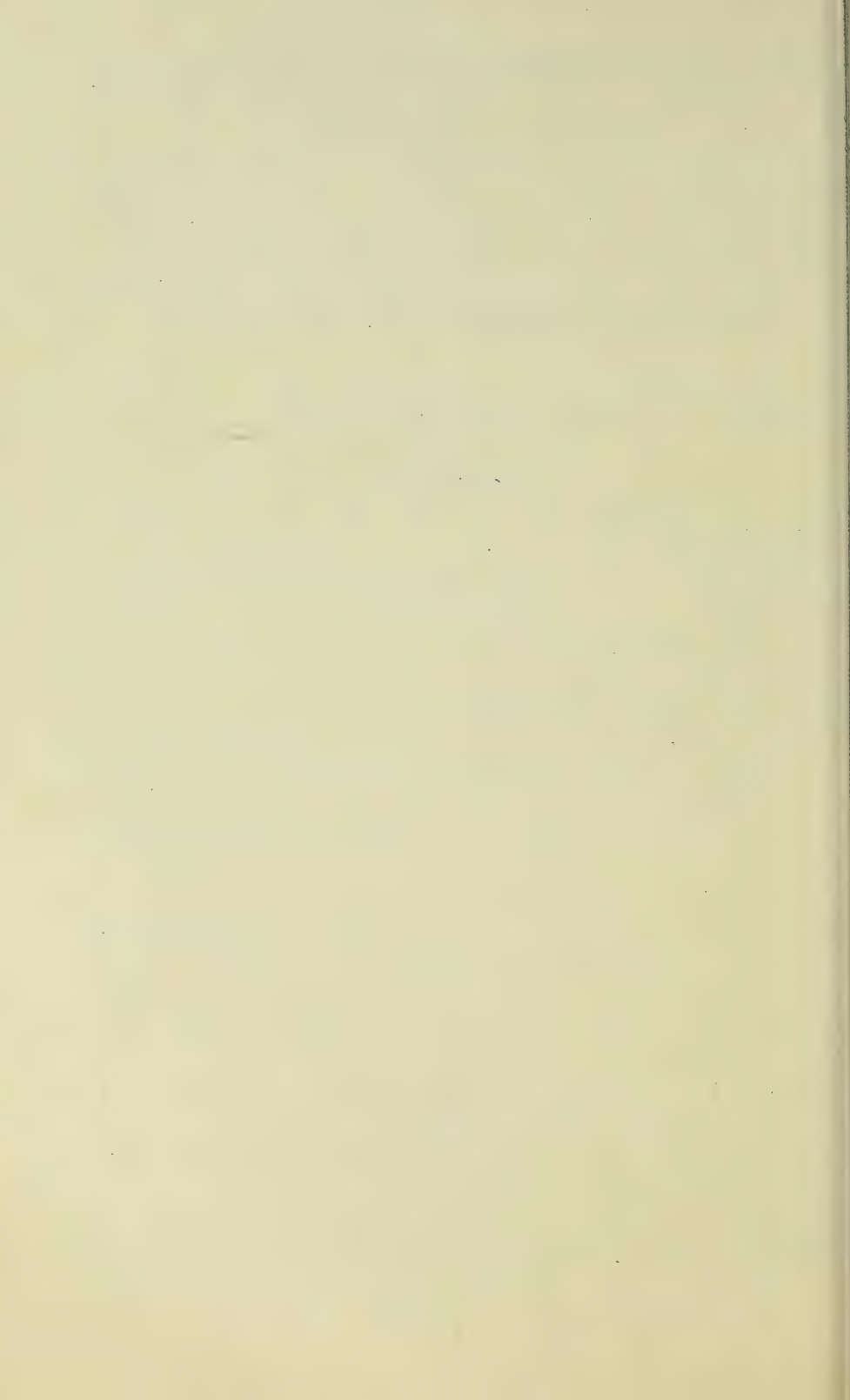
JULY, 1910.

COTTON DISEASES IN MISSISSIPPI

By R. P. HIBBARD, PH. D.

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18. Areolate Mildew.
19. Cotton Leaf Blight.
20. Some References to the Literature of Cotton Diseases.



COTTON DISEASES IN MISSISSIPPI

By R. P. HIBBARD, PH. D.

1. Introduction.

It is the purpose of this bulletin to present in a concise and convenient form to the cotton growers of this state a statement of our present knowledge concerning the diseases of cotton. This publication is by no means a contribution to scientific literature but a compilation intended as a ready reference and written to supply a demand for it.

2. Disease.

Ordinarily a plant is considered diseased when the life of a part or the whole of it is threatened. Strictly speaking the plant is diseased when it is deprived of any of the favorable conditions for growth and development. The development of any plant depends on a series of external factors such as light, proper temperature, kind and proportion of food, plenty of room and a suitable supply of water. When all these external factors combine in the most favorable manner the plant is vigorous and healthy. On the other hand when one or more of these conditions are lacking or over abundant the normal development of the plant is interfered with, to a greater or less extent, and the plant is sickly. After a sickness of this type the plant may recover providing the cause of the trouble is removed. When, however, the sickly condition leads to the death of a part or the whole of the plant, then, according to common custom, we call the plant diseased. This is the interpretation which is taken of this word throughout this paper.

It is therefore apparent that the more the farmer learns of the conditions favorable for his crops so much the more successful will he become in preventing the various diseases. Diseases in plants are contagious or "catching" like certain diseases, namely measles and smallpox in the human race are catching. This is due to the fact that some are more susceptible. They are weaker or less able to resist disease. The same is true among plants. Some plants especially those which have low powers of resistance take disease easily. The previous condition or predisposition of the plant is an important factor to be considered. The presence of the disease agent or parasite is another factor, but, more important than either, is the relation between these two factors. The agent of the disease and the pre-

disposition of the plant may be such that should conditions be right disease would ensue. For example, the Dillon variety of cotton planted in a wilt sick soil has yielded $1\frac{1}{2}$ bales per acre while the Truitt made a very poor yield. In the former case the agent of disease, the wilt fungus, was present but the variety of cotton was such that the disease had no effect on it. The conditions were against any chance for sickness and the result was a good crop. In the latter case the plant was predisposed to the disease, the wilt fungus was present and the result was a poor yield. The agent of disease found in the Truitt variety the conditions favorable for its development. The Truitt variety is therefore considered susceptible while the Dillon is resistant or immune. It must be mentioned here that the factors which contribute to the predisposition of the plant are both external and internal. The first has to do with the plant's surroundings or environment and the latter to internal inherited traits.

3. Symptoms of Disease.

Disease is present in most any field, and at any time, yet it is only at special times that it is apparent enough to attract wide-spread attention. This is a fact in the case of epidemics. When everything is considered, the losses from epidemics are small as compared to those from troubles that are not spectacular in their appearance but nevertheless constantly and unceasingly working injury. It is strange, yet true, that few recognize disease. Every one who makes his living from the soil and what it produces should become familiar with the signs, indications or symptoms of disease. In order to aid those interested, and in the hope of interesting more, in the study of plant diseases and the methods of combatting the same, the following outline as taken from Dr. Heald's article on "Symptoms of Disease" is inserted here:

- (1) Discoloration or change of color from the normal.
 - (a) Pallor; yellowish or white instead of normal green.
 - (b) Colored spots or areas on leaves or stems.
 - Whitish or grey: mildews, white rusts, etc.
 - Yellow: many leaf spots.
 - Red or orange: rusts, leaf spots, etc.
 - Brown: many leaf spots.
 - Black: black rust, tar spots, etc.
 - Variegated: leaf spots, etc.
- (2) Shot hole: perforation of leaves.

- (3) Wilting: "damping off", wilt, etc.
- (4) Necrosis: death of parts, as leaves, twigs, stems, etc.
- (5) Reduction in size: dwarfing or atrophy.
- (6) Increase in size: hypertrophy.
- (7) Replacement of organs by a new structure.
- (8) Mumification.
- (9) Change of position.
- (10) Destruction of organs.
- (11) Excrecences and malformations.
 - Galls: pustules, tumors, corky outgrowths, crown galls, etc.
 - Cankers: malformations in the bark generally resulting in an open wound.
 - Punks or conches and other fruits of fleshy fungi.
 - Witches's brooms.
 - Rosettes and hairy root.
- (12) Exudations.
 - Slime flux.
 - Gummosis; especially for stone fruits.
 - Resinosis; especially for coniferous trees.
- (13) Rotting.
 - Dry rot and soft rot: the "gangrene" of plant tissue.
 - Root rots: generally woody or fleshy roots.
 - Stem or trunk: dry rot of trees, rot of modified stems like rhizomes, bulbs, or tubers.
 - Buds.
 - Fruits: fleshy fruits of various kinds.

4. Causes.

The cotton plant is subject to many and varied diseases, all of which may be roughly grouped under the following heads: First, fungous; second, bacterial; third, physiological; fourth, mechanical; and, fifth, diseases due to insects. It is not the purpose of this bulletin to discuss the last two topics and these will be passed over without further comment.

5. Losses.

Every year the farmer loses a fraction of his crop. The losses are often as great if not greater than those due to neglect of proper cultivation. In times of epidemics the greater part, if not the whole of his crop is ruined. Certain diseases remain in the soil year after year, and the farmer is at a loss to explain his low yields, and even

should he happen to know the cause, does little or nothing to remedy it. These troubles are usually attributed to season or luck. It is becoming more and more necessary that the farmer know something about the diseases to which his crops are subject. It is important to know the parasites which cause the troubles and to learn something concerning their life histories, in order that correct methods for controlling them may be followed. Every one should study how to prevent disease and how to improve the health of the plants. As much zeal should be displayed in this matter as is shown in taking advantage of all the smaller improvements in cultivation.

At the present time the increasing competition in cotton culture, the decreasing productiveness of many soils, and the introduction of the cotton boll weevil are factors which will aid much in the development of ways and means for the prevention of cotton diseases. In addition it will make the farmer take advantage of every opportunity to increase the quality, quantity and earliness of his crop. All this can be accomplished by a thorough understanding of the necessary conditions for growth and the avoidance of disease.

Throughout the cotton belt the loss by disease varies between twenty-five and thirty millions of dollars. This state suffers a loss ranging from three to five millions yearly and this total is increasing annually. As startling as these figures are they are not nearly so suggestive to the farmer as some personal recollection he may have of local loss. There are many such persons in this state judging from the letters that have been received. These letters are especially numerous when the season is wet and warm for then the conditions are most favorable for fungous troubles.

The amount of injurious fungous diseases differ every season. One season cotton anthracnose may affect only the more sensitive varieties of cotton and the next season will cause a loss of the most resistant forms. All varieties of the cotton plant are not equally susceptible to fungous troubles and this important fact has led to the selection and breeding of varieties which will possess all the qualities desired and at the same time carry the high resistance necessary to combat the fungous pests. Such is the foundation of the most important principle for the prevention of disease in plants, and it is to the farmer's advantage to wage war against plant diseases by selecting pure seed and breeding resistant varieties. That the more progressive farmers are seeing the advantages of such methods is becoming more and more apparent. When more show interest, the time

will quickly come when the crops will be larger and the returns from them greater.

The diseases of cotton are numerous and increasing yearly. As already noted this bulletin will only deal with those caused by fungi, bacteria and unfavorable soil and weather conditions, the latter a class of diseases called physiological.

6. Fungi.

A fungus (plural fungi) belongs to the plant kingdom and is produced from a spore which is similar to the seeds of corn or cotton in this respect that it is the origin or beginning of the mature plant which is later to develop. It differs from the seed by being so small that it cannot be seen except when magnified many times by the aid of a microscope. Again it differs from the seed because it possesses a simple structure. The seed contains the future plant in miniature—the beginnings of the stem, leaf and root. It has therefore a complex structure. The spore is a minute portion of jelly like substance called protoplasm enclosed by a delicate but exceedingly tough membrane or outer coat known as the cell wall. It has therefore a structure of the simplest form.

Fungi are the lower forms of the vegetable kingdom. They vary in size from those that cannot be seen with the naked eye to those of much larger size like the mushrooms, toad stools and shelf fungi. They grow in various places and are found on decaying vegetable and animal matter. Some are pink, some red, some black, in fact almost any color can be found except green. Fungi, therefore, differ from the ordinary green plants since they do not possess this green coloring matter which is called chlorophyll and which by the aid of sunlight has the power of changing the water, the gases of the air, and the mineral salts of the soil into suitable substances for the nourishment of the plant. Fungi being deprived of this method of making food have to subsist on food built up by others, such as animals and green plants. Fungi live as saprophytes or parasites, the former existing on dead and decaying matter, the latter on living matter. As examples of the first we have the moulds found on leather, bread and cheese, and the toadstools developing in the manure piles and damp moist soils. The parasites get their food from the tissues and juices of the living plant or animal, and are represented by such fungi that cause wilts, anthracnose and blights.

Fungi have two structural parts, the mycelium and the spore. The mycelium is the vegetative part and serves the same purpose for

the fungus as the root, stem, and leaf do for the higher plants. This mycelium is composed of fine microscopic threads, more or less branched and twisted to form loose wooly masses like the green mould on leather. Sometimes the mycelium may be compacted to form solid bodies like the toadstools. The mycelium of a parasitic fungus finds some opening on the plant and thus penetrates to the internal tissues and meeting with favorable conditions for growth is soon found developing rapidly. Wounds and breathing pores are suitable openings for the entrance of fungous spores and bacteria. The spore as already noted is the reproductive body and is the beginning of another fungus. Spores develop in great numbers and first germinate on the surface of the plant. In order to germinate they must absorb moisture, a fact that explains the great influence of weather on fungous diseases. In wet weather plenty of water is present and the spore germinates and enters the plant where it there finds suitable conditions for growth and is not further dependent on weather.

Fungi have a shorter period of life as a rule than any of the green plants. Some live but a few days, others until the food supply gives out. They grow rapidly and decay rapidly. Generally speaking there are as many kinds of fungi as there are kinds of higher plants, and so too there are many kinds of spores. They are even as varied as the seeds of garden and field crops. The fungi are classified chiefly on the difference in the appearance of their spores. A certain kind of spore produces the toadstool, another the mold on bread, and still another the puff ball. So the plants of the lower kingdom of which we take so little notice are as varied in form as those we are more intimately acquainted with in every day life. The fungi with which we are concerned in this article are injurious and belong to the class called parasites.

The effects produced by fungi while growing in plants are varied. Any or all parts of the plant may be affected. Some diseases are peculiar to one part of the plant for example, the leaf, stem, root or fruit, and others are found distributed on many parts. The leaf may be covered with spots of various colors or may curl up and drop off. The plant may rot or the fruit become spotted. Plant diseases have received many popular names such as wilts, rots, rusts, smuts, mildews, blight and anthracnose.

The parasitic fungi have been divided into three groups: (1) The external fixed or stationary parasite; (2) the internal fixed parasite; (3) the internal moveable parasite. The first group can be represented by the cobwebby growths found on the stems, leaves, and

fruits. As examples, we have the powdery mildew of the grapes, cucumbers, etc. The second group includes the smuts, rusts, downy mildews, etc., and is much the largest group. The third is characterized by diseases due to bacteria such as black rot of cabbage, blight of apple, pear and quince and the angular leaf spot of cotton.

7. Bacteria.

The forms which we are now to consider are also agents of disease. They are classed among the fungi and known as bacteria. Bacteria are microscopic plants of simple structure and often mentioned as germs, microbes and micro-organisms. They obtain their food, like all other fungi, from organic matter and are unable to manufacture it from inorganic salts. When they exist on living matter, they go by the name of parasites; if on dead or decaying vegetable matter, they are called saprophytes. Bacteria are extremely minute. It would take 25,000 of the ordinary sized rod shaped forms placed end to end to measure an inch. 300,000 billion germs would weigh only an ounce. Bacteria occur in three shapes; namely, rods, spheres and spirals. They increase in number or reproduce themselves by the simple process of splitting in half. It takes about thirty minutes for a germ to reach maturity and reproduce itself. Figuring on this basis one bacterium would in seven hours have one million descendants. In twelve hours there would be about 70 billion and in a few days, if conditions were favorable, there would be enough to fill the air, the oceans, and cover the land. This would happen only under favorable conditions for bacterial growth and such are hardly ever present. There are ever present many natural and artificial checking forces which stop development. Bacteria are influenced as much by their surroundings as we are. Proper conditions must exist or their life terminates. They all need food, the right degree of temperature and a moderate supply of moisture. Germs are found everywhere; in the air we breathe, the food we eat, the water we drink and the soil we tread upon. There are only a few disease producing or pathogenic forms, the great majority being harmless, and quantities of them actually beneficial. Previous to the time when the germ theory of disease was first made public bacteria were considered unimportant. Now, since they are closely related to many infectious diseases, they have been the main factor in the establishment of a new science, bacteriology. Only in recent years have these germs been found to be the cause of a number of most serious plant diseases. They find their entrance into the plant tissues through wounds, breath-

ing pores, and rootlets and are as harmful in their results as the fungi already considered.

8. Physiological Diseases.

The physiological diseases which we are to consider lastly are little known. The causes are often so obscure that little can be found out concerning their nature. As a rule these physiological troubles are due to some disturbance of the natural surroundings or some interruption of the natural functions of the plant. These troubles are often progressive in nature, one stage of disease predisposes the plant to another and it in turn to a third. Different conditions produce different troubles. Cold weather is one common cause of plant troubles of this kind. Injuries usually result from a mild late fall followed by a sudden severe freeze; or from an unusually severe winter; or from mild open winter weather inducing a flow of sap followed by freezing weather; or lastly, an early spring inducing premature blossoming followed by killing frosts. Heat will retard the transpiration of moisture from the plant and produce wilting or tip burn. It will also dry up the soil and in seasons of drought the plant is sickly, wilts, and if not destroyed will ripen prematurely. Water in great abundance is a source of trouble. Excess of stagnant water in the soil prevents the entrance of air to the roots, and induces the formation of poisonous substances and injurious acids which hinder the growth of the plant, if they do not ultimately kill it. A well drained field is one essential to good agriculture. An excess of water on the stem and leaves affords the proper conditions for the germination and spread of fungous diseases. A reduction in the fertility of the soil is also a source of disease. Such soils lack the proper food material. Injury can be done in this way as well as when too much food is present. Fertilizers when used carelessly, burn the foliage, sometimes injure the roots, and often kill the young plants. Sufficient illustrations have been mentioned to show what kind of diseases we designate as physiological. The investigation and solution of these troubles is becoming more and more necessary and remedies for such are as important as those for fungous maladies.

9. Cotton Wilt.

(a) **Occurrence.**—Wilt here described is distinctly different from the wilting caused by drought and the wilting which is the result of a disease of cotton known as root rot. Wilt is widely distributed throughout the State. It has been found in light sandy soil, impoverished soil and in rich black land and on black prairie land. In fact,

it appears that there is no soil suitable for cotton growing where wilt is not met with. When once the soil is infected the disease remains and easily spreads unless efforts are made to prevent it.



FIG. 1. Cotton Wilt (after W. A. Orton, Bull. 333, Bur. Plant Industry, U. S. Dept. Agri.).

especially when the rainfall is plentiful in early spring and during the growing season.

(b) **Symptoms.**—The external characteristics are first apparent when the leaves turn yellow at their margins and between the veins. Later the whole leaf becomes yellow and drops off. In extreme cases of wilt nothing but the bare cotton stalks and branches are left. In less severe cases one or two branches may be stripped of leaves while the rest of the plant is apparently unaffected. Wilted plants may partially recover but will always show a stunted or bushy appearance.

It is by means of the internal appearance of the affected cotton stalk that we establish without a doubt the cause of this disease. The

Single plants in a field may show the disease. A plant may be only partly wilted while the rest of the plant will be in a vigorous condition. In a row, only here and there, one may see wilted plants. Wilt as above mentioned causes only slight loss, but when definite patches or areas are established and each successive year enlarges these spots we are then confronted with a more serious loss.

Wilt assumes a more serious aspect in the Delta region than in any other part of the state.

The cotton plant is subject to wilt at an early date. When about ten or twelve inches high, it is susceptible and from then on to maturity. Wilt is most abundant in June and July,

wood in the region of the water conducting vessels that pass up the root and stem is brown. When the stem is cut across with a knife this brown ring is clearly seen and is due to the dense closely woven threads or hyphae of the fungus which has filled up the vessels, shut off the water supply and killed the plant. This brown ring in the



FIG. 2. Cotton Wilt; wilted plant on right, resistant plant on left (after W. A. Orton, Bul. 333, Bur. Plant Industry, U. S. Dept. Agri.)

stem is characteristic of this disease. In addition to the above symptoms the tap root of a wilted plant is shorter, and the lateral roots less abundant.

(c) **Cause.**—This disease is due to a microscopic plant, a fungus which goes by the name of *Neocosmospora Vasinfecta*. It is found in an actively growing state in the soil existing on decaying organic matter. The soil then is its original home or habitat and in this place its existence is that of a saprophyte. But when it enters the root and stem of a cotton plant it changes its nature and becomes parasitic. How does the fungus get within the root or stem? Wounds or abrasions on the roots afford suitable places for the entrance of the exceedingly delicate threads of this fungus. Wounds and abrasions, though suitable centres of infection, are not necessary, for the fungus is able to penetrate even healthy roots. Once within the roots it travels or grows up the sides of the water conducting vessels, finally growing so dense that the cavities are choked up and death results.

(d) **Remedies.**—Cotton wilt cannot be controlled by spraying with fungicides for the cause of the trouble is found within the plant. The soil, which is the natural habitat of the fungus, has been treated in various ways with poisonous substances. None of these solutions have as yet proven efficient. On the other hand they have not only proved impracticable but expensive.

Barn yard manure, though sometimes suggested as a corrective agent, has so far proven of very little practical value. Commercial fertilizers are neither detrimental nor advantageous.

It has been suggested that the soil can be freed from this disease through a system of rotation, yet data have been collected to show that this takes from seven to ten years and the results are not as promising as one would expect. Deprived of cotton as a source of food it still continues living by subsisting on decaying matter and so prolonging its life as a saprophyte for a term of years. Wilt gradually diminishes when the land is put into rotation but is not entirely eradicated for the period of time mentioned above.

The destruction in the fall of all diseased plants lessens in a measure the spread of this disease. At the same time it kills the boll weevil and other injurious insects, and keeps the land in better sanitary condition.

The most efficient method of control lies in the use of resistant varieties that can develop well and reach maturity in spite of the adverse soil conditions—wilt infected soil. These wilt resistant forms have been produced by breeding and selection. Mr. Orton of the Department of Agriculture has produced resistant varieties from both the upland cotton and the Sea Island cotton. Those of the Upland variety are the Dillon and the Dixie. Those of the Sea Island are the Rivers and the Centerville. The farmers that have wilt sick land should by all means plant seed raised from wilt resistant varieties.

10. Anthracnose.

(a) **Occurrence.**—Anthracnose, pink boll, or boll rot is year by year increasing throughout the state. It is present in the Delta region, in the sandy hill region, in the prairie and on the bottom lands. It can be found in all sections of the state where cotton is grown but is more prevalent and exceedingly troublesome in the Delta region, and in the central and northern section of the state. On some farms only a fractional per cent of the crop is lost from this disease, while on others the loss is from 80 to 90 per cent.

The condition of the weather has much to do with the amount of anthracnose. A very dry season hinders the development of the spores and affords a natural means of checking the spread of this disease. On the other hand a wet season creates the most suitable conditions for its development and spread. So little is known about this disease that we are not yet in a position to give a complete discussion.

(b) **Symptoms.**—Anthracnose, pink boll, or boll rot is determined primarily from external characteristics. It is most destructive as a boll disease, yet it also injures the stem, leaf and cotyledons of young seedlings. The first indication of trouble on the boll is shown in the appearance of small reddish brown spots, which grow larger and become depressed in the tissues of the boll. Soon the spores develop and occupy the centers of these spots. Climatic conditions are responsible for the abundance or scarcity of these spores. If the conditions have been favorable, large quantities of spores are produced and the pink color is very apparent, otherwise they are scarce and the diseased areas have a grey cast.



FIG. 3. Anthracnose of Cotton (after R. W. Harned, Bul. 139, Boll Weevil, Miss. Exp. Sta., 1909).

A boll which is badly diseased externally upon opening will disclose rotten and badly discolored lint. The lint in partially diseased bolls is inferior and harbors countless pink spores. The greatest

damage to the bolls is done before they mature. If attacked near the time of maturity, the normal development is interfered with and an imperfect boll partially diseased is the result. From these half opened, dried bolls the lint is hard to gather and oft times is never touched. The loss of cotton in this way is quite a large item.

This fungus also attacks the stems of young plants near the ground often causing death. The cotyledons are also injured by the fungus which is imbedded in its tissues. Greyish or pinkish spots are found on the weaker leaves. The stem may also show these depressed pink or grey areas so constantly met with on the bolls.

(c) **Cause.**—This disease is attributed to a fungus, *Colletotrichum Gossypii*. Its life history has not yet been completely worked out, but much has already been determined through the careful investigations of Professor Barre of Clemson College, South Carolina. Professor DeLoach, when connected with the Georgia Experiment Station, also added much to the investigations on cotton anthracnose. Professor Edgerton of the Louisiana Station has succeeded in finding the perfect stage developing under natural conditions.

The fungus is an active parasite able to penetrate any portion of the cotton plant and cause disease. Professor Barre's investigations show that the fungus winters over in the seeds which, when germinated in the following spring produces the disease in the seedling or young plant. The spores also winter over in the diseased stems, bolls and seed in the field. Ten months appears to be the length of time they can sustain life under adverse conditions. Much has yet to be learned concerning this serious pest which causes considerable loss throughout the state every year.

(d) **Remedies.**—Various remedies have been tried, but our knowledge is yet too incomplete to advise any definite remedy.

Spraying with fungicides has not proven practical, since this would have to be done when bolls were open, thus spoiling the lint. As infection has been traced to the seed the spray would not reach the centre of infection.

Treating the seed with poisonous substances has not proven effective.

By selecting clean seed from bolls unaffected the disease can in a measure be checked.

Professor Barre suggests that a one year's rotation with clean seed ought to eliminate cotton anthracnose. The burning of the stalks in the fall will retard the spread of this fungus pest.

The most attractive and apparently the most successful remedy would be the development of a disease resistant variety.

11. Cotton Rust.

(a) **Occurrence.**—Black rust, yellow leaf blight and mosaic disease are classed under the general term of rust. They are merely different names for the same malady. Rust is common throughout the state and the loss from this disease is considerable. It is present on worn out and light sandy soils or on soils which contain little or no humus. The disease is very likely to appear on wet poorly drained soils. Unfavorable weather conditions also favor the development of rust. Rust develops in spots in the field and appears year after year unless remedies are applied.

From records in this office, though incomplete at present, we learn that most of the rust is located in a narrow strip through the centre of the state from north to south and as far south as Lamar and Marion counties.

(b) **Symptoms.**—This disease affects the leaves. The first indication of trouble is shown in the yellow mottled appearance of the leaf. The yellow portions are farthest away from the source of food supply, the veins. These latter stay green for a longer time. Being deprived to a great extent of the means of sustenance the leaf in a weakened condition becomes a prey to various fungi which ultimately destroy it. The leaves fall off and sometimes the stalk is entirely bare. Such plants do not set a top crop as a rule and therefore the yield is seriously reduced. The lint is often badly damaged being shorter and inferior in quality.

(c) **Cause.**—The disease is due to unfavorable soil and weather conditions. Thrifty and vigorous plants do not suffer until the food supply is withdrawn. The three important factors to which rust is attributed are (1) lack of humus, (2) lack of potash, and (3) lack of drainage. Heavy rains followed by long droughts cause no injury to the cotton plant if the soil is in a condition of proper tilth and fertility. Let these conditions be reversed and serious outbreaks of rust will follow. Diseases of this class are all called physiological, since they are responsible for the constant interruption of the normal development of the plant.

(d) **Remedies.**—The remedy for rust lies in changing the unfavorable soil conditions and in securing conditions that will support a vigorous growth of the plant.

When land has been cropped to cotton for a long term of years it lacks humus or decaying vegetable matter. This kind of soil needs building up and can be done by plowing in a green crop. A crop of cowpeas or beans are especially good. Barnyard manure is beneficial and will do much to prevent rust. Kainit or potash at the rate of 200 pounds per acre will do equally as well as barnyard manure if the latter is not available. Better drainage of wet lands and seepy hill-sides will also reduce rust.

12. Red Rust.

Another kind of rust which is often confused with the rust just described is called red rust. The leaves are attacked by a mite which is similar to the red spider. The injury done appears on the leaf and shows itself by a red coloration of a part or the whole of the leaf. In extreme cases this disease causes the complete defoliation of the plant. The trouble is of slight importance. It occurs in new fields as a rule and only in comparatively small patches. Rain checks the spread while dry weather exaggerates the trouble. The insects thrive better in the latter condition. No practical remedy has as yet been found efficient.

13. Damping-off or Sore-Shin.

(a) **Occurrence.**—Sore-shin, damping-off or seedling rot occurs quite widely throughout the state wherever cotton is grown. It does not very often cause serious loss, though many young plants are killed during cold wet unfavorable springs.

(b) **Symptoms.**—The young plants first show signs of weakness in the stem near the surface of the ground. The turgid cells lose the water they contain and become flabby. At this point the stems bend and the plant falls to the ground. Quite often the plants are only partially affected. This is true of the older plants. One side is marred by a canker or ulcerous depression. Unless these diseased spots interfere seriously with the normal functions of the plant, the latter will partially recover but will never be normal.

(c) **Cause.**—The sterile fungus, *rhizoctonia*, is usually considered the cause of this trouble. Its natural habitat is the soil.

The disease is sometimes due to the anthracnose fungus or other parasites. Such damping off disease must be clearly distinguished from wilting due to dry soil or dry air. If warm favorable weather prevails, the cotton seedling may outgrow the disease.

(d) **Remedies.**—As the sterile fungus prefers acid soils, and alkaline soils are fatal to its growth it would follow that the addition of lime to the soil would be exceedingly beneficial.

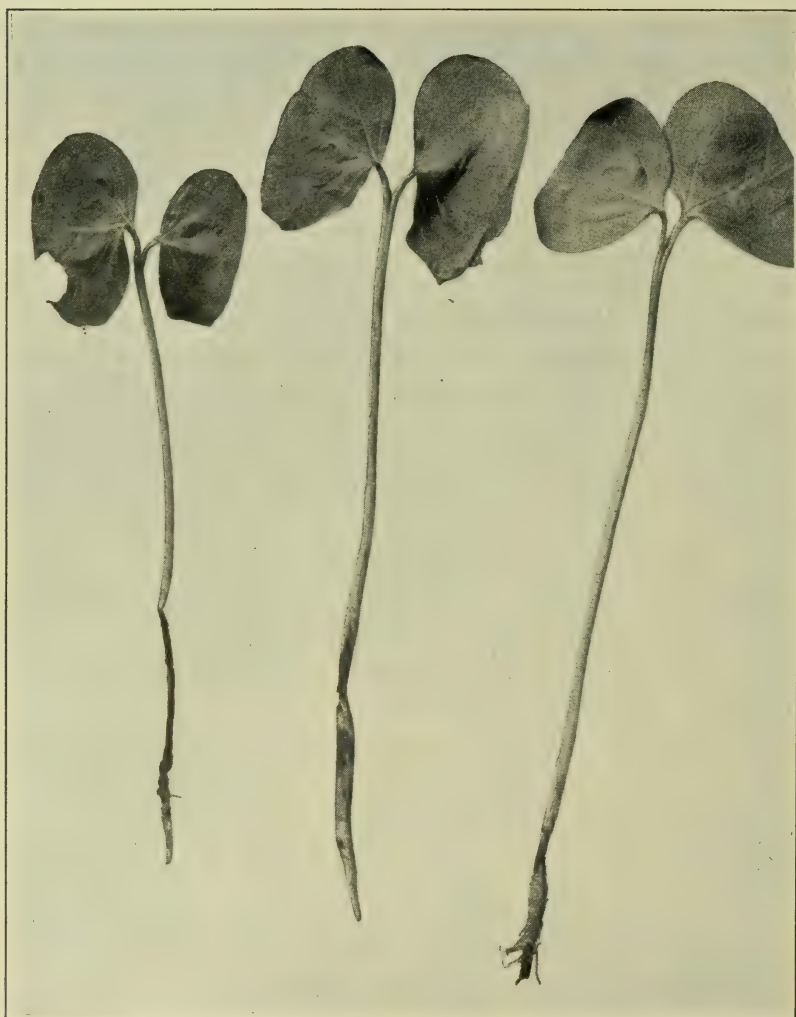


FIG. 4. Sore-Shin or Damping-Off of Cotton (after F. D. Heald).

14. Bacterial Blight.

(a) **Occurrence.**—This disease is known to attack the stem, boll and leaf. On the stem the trouble goes by the name of black arm;

on the boll, boll-spot; and on the leaf, angular leaf spot. All three diseases are due to one and the same cause, a bacterium or microbe. This blight is probably found in every cotton field during the summer months but only after careful search would one be able to see it. The trouble is not yet of economic importance.

(b) **Symptoms.**—The first appearance of the disease is on the under surface of the leaf. Here one finds green colored, water-soaked, angular areas of varying sizes. Later these spots appear on the upper surface of the leaf, the fungus having grown through the leaf. These spots turn purple and finally become brown. These diseased areas seem to be scattered about the surface of the leaf without any definite arrangement but on closer examination they are found to surround the breathing pores or stomata. The method of infection then is chiefly through these breathing pores.



FIG. 5. Angular Leaf Spot of Cotton (after Dr. E. F. Smith).

The symptoms that appear on the bolls are very similar to those on the leaf. The injury on the stem appears in the form of a canker, or ulcer which saps the vitality of the plant. The shedding of bolls is sometimes due to the injury from this bacterium. The stems, bolls and pedicels, like leaves, may weaken and lose vitality. This affords suitable conditions for the invasion of parasitic fungi and bacteria, chief among which is the anthracnose fungus.

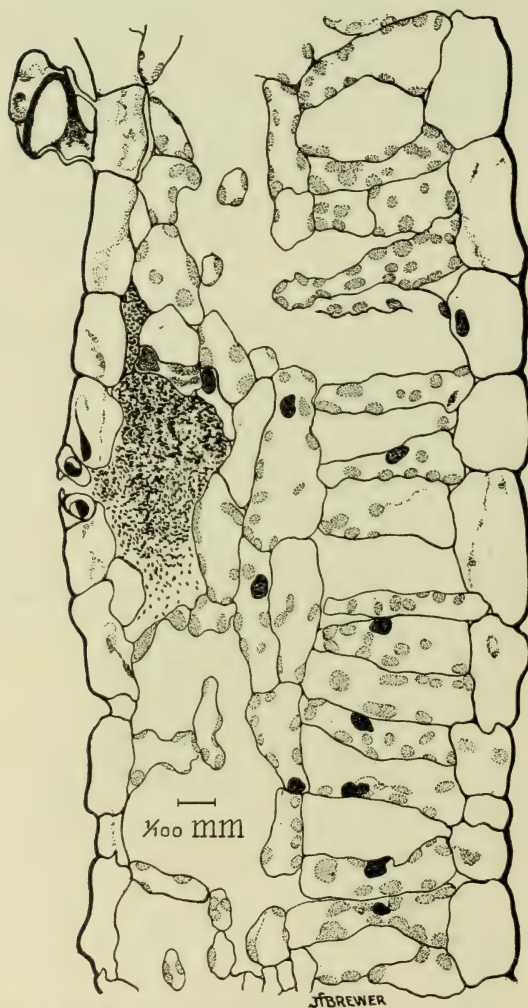


FIG. 6. Angular Leaf Spot of Cotton; bacteria in the tissues of the leaf (after Dr. E. F. Smith).

(c) **Cause.**—In the angular spots on the leaves and the water soaked areas of the bolls countless numbers of microbes are to be found. These were isolated by Dr. Erwin F. Smith of the Department of Agriculture to which he gave the name of *bacterium malvacearum*. The final destruction of the plant is due often to the presence of the anthracnose fungus and certain decay bacteria.

(d) **Remedies.**— There has been little necessity for a remedy and therefore no efficient method has been worked out. The disease usually appears during the time when the cotton is most vigorous and succulent and may be partially checked therefore by so treating the soil that less succulent plants are produced. This can be done by reducing the supply

of nitrogen and increasing the potash content of the soil. It has been suggested that the infection is carried in the seed. The trouble could

then be lessened or checked by the selection of clean, healthy seeds from well matured healthy bolls.

15. Shedding of Bolls.

(a) **Occurrence.**—Squares, forms and young cotton bolls often fall for other causes than that due to the injury by insects. Not all of the shedding can be attributed to the boll worm or weevil. In many instances no fungus or insect can be found on or in the affected parts. Such shedding is simply an outward manifestation of improper or faulty nutrition and assimilation. The disease is a physiological one. Climatic conditions have much to do with the presence or absence of this trouble. It is quite common in either very dry or very wet weather. It is also present during the change from one extreme to the opposite. If the plants are crowded and the growth rank, sufficient food is not available to supply all fruit forms especially those furthest from the course of supply, consequently many squares fall.

Some varieties of cotton seem to be more susceptible than others. Certain soil conditions have a detrimental influence and aggravate this trouble. Even the character of the fertilizer is said to show a marked effect on shedding. During some seasons the loss by this disease is considerable. Under normal conditions there is also a loss which, however, does not reach an alarming stage.

(b) **Symptoms.**—The symptoms are easily recognized. The parts affected change in color from a deep green to a pale green and finally become yellow. In the majority of cases the forms drop off, yet it is not uncommon to find some attached to the parent plant by a few strands of the peduncle or stalk.

(c) **Cause.**—This disease is a physiological one and cannot be attributed to any one cause. It is rather the result of a series of causes which are constantly changing. Such causes are the unfavorable conditions of climate and soil.

(d) **Remedies.**—Physiological diseases have as yet received little attention at the hands of plant pathologists and for that reason it is difficult to give any reliable remedy. We have no control over climatic conditions and therefore the hope of a suitable remedy lies in the direction of a thorough study of soil conditions. A system of soil preparation, culture and fertilization with a view to affording the best conditions for the development of the plant should do much towards checking this malady.

16. Root-Knot, Root-galls, Root Nematodes.

(a) **Occurrence.**—Only a few cases of root-knot of cotton in this state have been brought to my attention, yet I am loath to believe that it is not quite common, especially on thin sandy soil and worn out lands. Cotton growers are probably more ignorant of the presence of this disease in their fields than any other. This is likely the true explanation of the lack of satisfactory information on the distribution of this trouble throughout the state. Mr. Orton, of the Department of Agriculture, has found that root-knot of cotton is often associated with wilt. Root-knot so weakens the root system that it affords easy or favorable conditions for the entrance of the wilt fungus. Many weeds and cultivated plants are subject to this trouble. One of our best soil renovators, the cowpea, is very susceptible. It is bad economy to follow diseased cowpeas with cotton.



FIG. 7. Root-Knot on Cotton Plant (after W. A. Orton, Bull. 333, Bur. Plant Industry, U. S. Dept. Agri.)

(b) **Symptoms.**—Root-knot is a disease that attacks the roots or underground parts of the cotton plants. All cotton plants suffering from root-knot are dwarfed. When the roots are badly diseased, the plant suffers a lack of food and water, wilts and finally dies. A plant may not show any striking symptoms but on examining the roots the cause of the disease can be easily determined. They are covered with warts, galls or excrescences of various sizes and shapes, and sometimes are as large as an inch in diameter. When the affected roots begin to die they send out new roots so that before long the root system becomes bushy and tangled.

(c) **Cause.**—This root affections is due to a microscopic worm about 1-20 to 1-60 of an inch long. It burrows into the root, thus setting up an irritation which later produces these wart like excrescences or knots. If these knots are numerous the nutrition of the plant is interfered with. It becomes enfeebled and finally dies.

(d) **Remedies.**—No treatment of diseased roots with poisons, is practicable since the amount necessary to kill the worm would also seriously injure the root. Carbon bisulphide, arsenic and kerosene emulsions have been tried without success.

Alkaline fertilizers such as kainit, potash, and lime have been mentioned as good checking agents.

Allowing the land to go fallow for two seasons has resulted in almost ridding the soil of the worm. This method is expensive and unnecessary since there are crops that can be grown on land containing the root-knot organism without receiving any injury. Wheat, oats and rye are examples of such crops.

Clean cultivation which would rid the soil of infected weeds and diseased crops would be of great value in retarding the spread.

The best means of control rest in a proper system of rotation. Using crops that are not susceptible, and in this way starving out the nematodes.

17. Root Rot.

(a) **Occurrence.**—No root rot has been reported to the department as coming from this state. It is found in Texas where it causes a great deal of damage. It has not yet been found east of Texas (1906) but it is likely to spread in this direction. It is a soil fungus and, like its neighbor, the wilt fungus, is liable under favorable conditions to spread rapidly in the ground after it has once established itself. All types of soil are more or less subject to it. The lime soils of Texas, as

well as the black waxy lands which hold moisture so tenaciously have proven the most suitable soils for the development of this trouble.

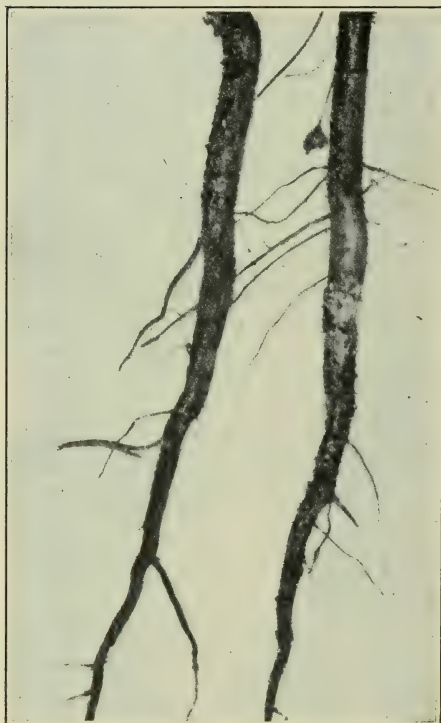


FIG. 8. *Ozonium Omnivorum* on Roots of Cotton (after B. M. Duggar.)

(b) **Symptoms.**—The first indication is a sudden wilting followed by the death of the plant in most cases. The disease usually appears about the latter part of June or the first of July, though it can be found at an earlier date and even when the plant is more mature. On pulling up the plant and examining the roots closely a further indication of disease can be noted. The diseased roots are covered with dirty yellowish filaments of the fungus which causes the trouble. Sometimes numerous scars are visible on the roots. The smaller roots are dead and dried up.

(c) **Cause.**—This disease is attributed to the work of a parasitic fungus which lives in the ground and rapidly spreads throughout the soil. It can enter the roots, through wounds but is perfectly able to penetrate healthy roots. Its strands or mycelia plug up the water conducting vessels and cut off the water and food supply. This fungus remains in the root and unlike the wilt fungus does not extend into the stem.

(d) **Remedies.**—Soil treatment with poisonous substances or fungicides is not an effective means of control. Attempts to breed a resistant variety have failed.

Deep plowing, together with a proper system of rotation seems at present to be the only adequate means of checking this disease. Mr. Shear of the Department of Agriculture, advises fall plowing at a

depth of 7 to 9 inches. In addition to this he advises a two or three year rotation with grasses or grains. The deep plowing aerates the soil to quite a depth and offers unfavorable conditions for the development of the fungus which thrives better in a compact soil that lacks air. That this work may be properly done, the cotton mule and ordinary plow will have to be replaced by heavy animals and 12 to 14 inch plows.

18. Areolate Mildew.

This disease and the one following will be mentioned briefly since they are of slight economic value.

Areolate mildew sometimes called frosty blight from the white snowy appearance of the under surface of the leaf occurs in the late summer and fall, and is found on the rank luxuriant plants growing in moist places. The fungus, *Ramularia areola*, which is the cause of this trouble, produces a partial defoliation of the plant, but as this takes place late in the season there is no appreciable interruption of the normal functions of the plant. This trouble has not proven serious enough as yet to warrant any investigations concerning methods of control.

19. Cotton Leaf Blight.

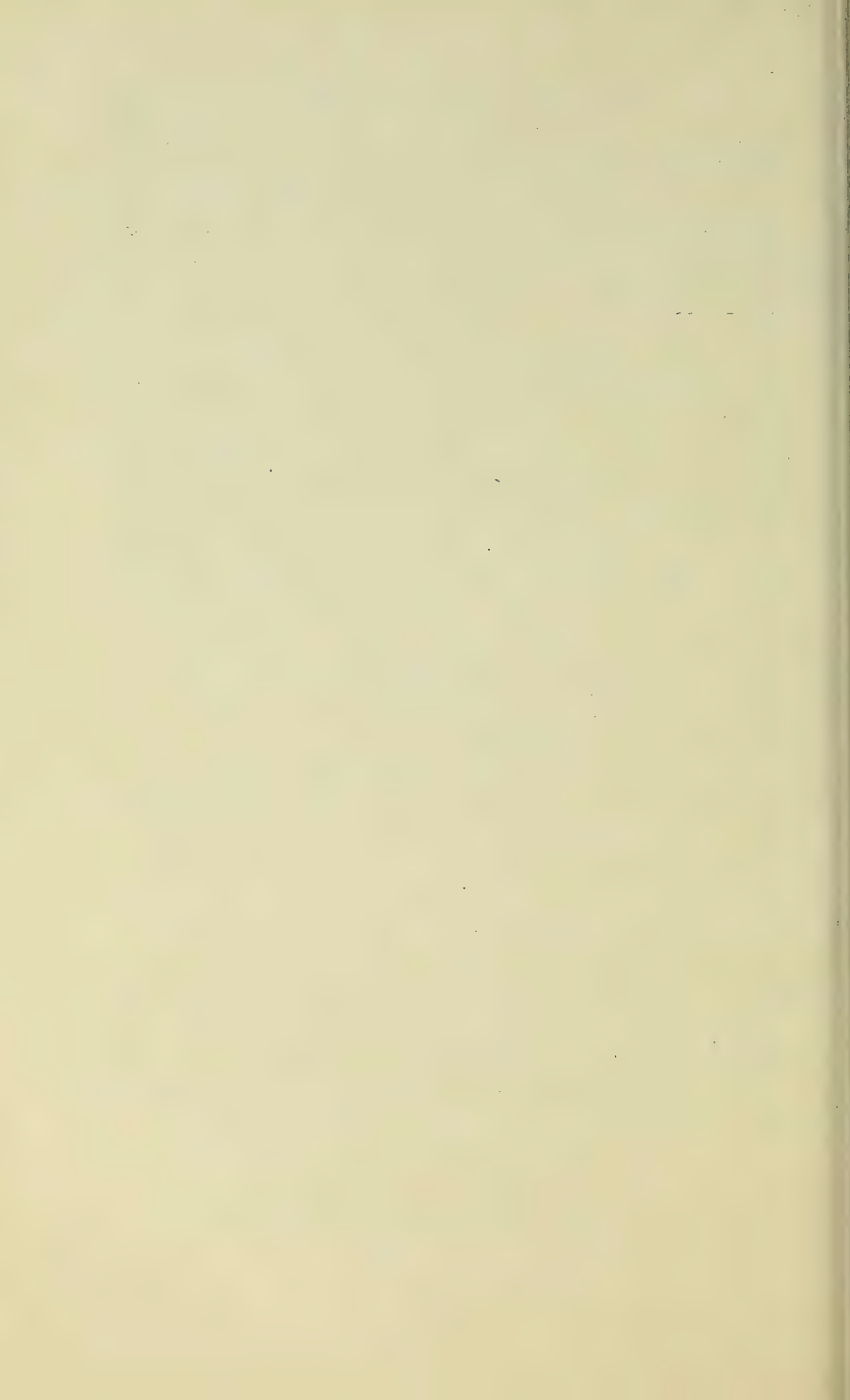
This disease is very common on cotton. It is found on the less vigorous or old leaves. It is likely to attack all the leaves of weak plants if the soil is wet and the climatic conditions favorable for the development of the fungus. This trouble affects the leaves by producing spots upon them. These spots are red at first, grow larger centrifugally and later turn brown. Sometimes the centers of these spots are white. This is the case when the spores are abundant. In the last stages of disease the leaves are ragged and full of holes. The fungus *Cecrospora Gossypina*, is the direct cause of this leaf blight. The strand or filaments are found within the plant while the fruiting bodies or spores are produced on the surface.

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Mississippi Agricultural Experiment Station



BULLETIN No. 140-B.



COTTON DISEASES IN MISSISSIPPI

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JULY, 1910.

Cotton Wilt.

(a) **Occurrence.**—Wilt here described is distinctly different from the wilting caused by drought and the wilting which is the result of a disease of cotton known as root rot. Wilt is widely distributed throughout the State. It has been found in light sandy soil, impoverished soil, rich black land and on black prairie land. In fact, it appears that there is no soil suitable for cotton growing where wilt is not met with. When once the soil is infected the disease remains and easily spreads unless efforts are made to prevent it.



FIG. 1. Cotton Wilt (after W. A. Orton, Bull. 333, Bur. Plant Industry, U. S. Dept. Agri.).

especially when the rainfall is plentiful in early spring and during the growing season.

(b) **Symptoms.**—The external characteristics are first apparent when the leaves turn yellow at their margins and between the veins. Later the whole leaf becomes yellow and drops off. In extreme cases

Single plants in a field may show the disease. A plant may be only partly wilted while the rest of the plant will be in a vigorous condition. In a row, only here and there, one may see wilted plants. Wilt as above mentioned causes only slight loss, but when definite patches or areas are established and each successive year enlarges these spots we are then confronted with a more serious loss.

Wilt assumes a more serious aspect in the Delta region than in any other part of the state.

The cotton plant is subject to wilt at an early date. When about ten or twelve inches high, it is susceptible and from then on to maturity. Wilt is most abundant in June and July,

of wilt nothing but the bare cotton stalks and branches are left. In less severe cases one or two branches may be stripped of leaves while the rest of the plant is apparently unaffected. Wilted plants may partially recover but will always show a stunted or bushy appearance.

It is by means of the internal appearance of the affected cotton stalk that we establish without a doubt the cause of this disease. The wood in the region of the water conducting vessels that pass up the root and stem is brown. When the stem is cut across with a knife this brown ring is clearly seen and is due to the dense closely woven threads or hyphae of the fungus which has filled up the vessels, shut off the water supply and killed the plant. This brown ring in the



FIG. 2. Cotton Wilt; wilted plant on right, resistant plant on left (after W. A. Orton, Bul. 333, Bur. Plant Industry, U. S. Dept. Agri.)

stem is characteristic of this disease. In addition to the above symptoms the tap root of a wilted plant is shorter, and the lateral roots less abundant.

(c) **Cause.**—This disease is due to a microscopic plant, a fungus which goes by the name of *Neocosmospora Vasinfecta*. It is found in an actively growing state in the soil existing on decaying organic matter. The soil then is its original home or habitat and in this place its existence is that of a saprophyte. But when it enters the root and stem of a cotton plant it changes its nature and becomes parasitic. How does the fungus get within the root or stem? Wounds

or abrasions on the roots afford suitable places for the entrance of the exceedingly delicate threads of this fungus. Wounds and abrasions, though suitable centres of infection, are not necessary, for the fungus is able to penetrate even healthy roots. Once within the roots it travels or grows up the sides of the water conducting vessels, finally growing so dense that the cavities are choked up and death results.

(d) **Remedies.**—Cotton wilt cannot be controlled by spraying with fungicides for the cause of the trouble is found within the plant. The soil, which is the natural habitat of the fungus, has been treated in various ways with poisonous substances. None of these solutions have as yet proven efficient. On the other hand they have not only proved impracticable but expensive.

Barn yard manure, though sometimes suggested as a corrective agent, has so far proven of very little practical value. Commercial fertilizers are neither detrimental nor advantageous.

It has been suggested that the soil can be freed from this disease through a system of rotation, yet data have been collected to show that this takes from seven to ten years and the results are not as promising as one would expect. Deprived of cotton as a source of food the fungus still continues living by subsisting on decaying matter and so prolonging its life as a saprophyte for a term of years. Wilt gradually diminishes when the land is put into rotation but is not entirely eradicated for the period of time mentioned above.

The destruction in the fall of all diseased plants lessens in a measure the spread of this disease. At the same time it kills the boll weevil and other injurious insects, and keeps the land in better sanitary condition.

The most efficient method of control lies in the use of resistant varieties that can develop well and reach maturity in spite of the adverse soil conditions—wilt infected soil. These wilt resistant forms have been produced by breeding and selection. Mr. Orton of the Department of Agriculture has produced resistant varieties from both the upland cotton and the Sea Island cotton. Those of the Upland variety are the Dillon and the Dixie. Those of the Sea Island are the Rivers and the Centerville. The farmers that have wilt sick land should by all means plant seed raised from wilt resistant varieties.

Anthracnose.

(a) **Occurrence.**—Anthracnose, pink boll, or boll rot is year by year increasing throughout the state. It is present in the Delta region, in the sandy hill region, in the prairie and on the bottom lands. It can be found in all sections of the state where cotton is grown but

is more prevalent and exceedingly troublesome in the Delta region, and in the central and northern section of the state. On some farms only a fractional per cent of the crop is lost from this disease, while on others the loss is from 80 to 90 per cent.

The condition of the weather has much to do with the amount of anthracnose. A very dry season hinders the development of the spores and affords a natural means of checking the spread of this disease. On the other hand a wet season creates the most suitable conditions for its development and spread. So little is known about this disease that we are not yet in a position to give a complete discussion.

(b) **Symptoms.**—Anthracnose, pink boll, or boll rot is determined primarily from external characteristics. It is most destructive as a boll disease, yet it also injures the stem, leaf and cotyledons of young seedlings. The first indication of trouble on the boll is shown in the appearance of small reddish brown spots, which grow larger and become depressed in the tissues of the boll. Soon the spores develop and occupy the centers of these spots. Climatic conditions are responsible for the abundance or scarcity of these spores. If the conditions have been favorable, large quantities of spores are produced and the pink color is very apparent, otherwise they are scarce and the diseased areas have a grey cast.



FIG. 3. Anthracnose of Cotton (after R. W. Harned, Bul. 139, Boll Weevil, Miss. Exp. Sta., 1909).

A boll which is badly diseased externally upon opening will disclose rotten and badly discolored lint. The lint in partially diseased bolls is inferior and harbors countless pink spores. The greatest damage to the bolls is done before they mature. If attacked near the time of maturity, the normal development is interfered with and an imperfect boll partially diseased is the result. From these half opened, dried bolls the lint is hard to gather and oft times is never touched. The loss of cotton in this way is quite a large item.

This fungus also attacks the stems of young plants near the ground often causing death. The cotyledons are also injured by the fungus which is imbedded in its tissues. Greyish or pinkish spots are found on the weaker leaves. The stem may also show these depressed pink or grey areas so constantly met with on the bolls.

(c) **Cause.**—This disease is attributed to a fungus, *Colletotrichum Gossypii*. Its life history has not yet been completely worked out, but much has already been determined through the careful investigations of Professor Barre of Clemson College, South Carolina. Professor DeLoach, when connected with the Georgia Experiment Station, also added much to the investigations on cotton anthracnose. Professor Edgerton of the Louisiana Station has succeeded in finding the perfect stage developing under natural conditions.

The fungus is an active parasite able to penetrate any portion of the cotton plant and cause disease. Professor Barre's investigations show that the fungus winters over in the seeds which, when germinated in the following spring produces the disease in the seedling or young plant. The spores also winter over in the diseased stems, bolls and seed in the field. Ten months appears to be the length of time they can sustain life under adverse conditions. Much has yet to be learned concerning this serious pest which causes considerable loss throughout the state every year.

(d) **Remedies.**—Various remedies have been tried, but our knowledge is yet too incomplete to advise any definite remedy.

Spraying with fungicides has not proven practical, since this would have to be done when bolls were open, thus spoiling the lint. As infection has been traced to the seed the spray would not reach the centre of infection.

Treating the seed with poisonous substances has not proven effective.

By selecting clean seed from bolls unaffected the disease can in a measure be checked.

Professor Barre suggests that a one year's rotation with clean seed ought to eliminate cotton anthracnose. The burning of the stalks in the fall will retard the spread of this fungus pest.

The most attractive and apparently the most successful remedy would be the development of a disease resistant variety.

Cotton Rust.

(a) **Occurrence.**—Black rust, yellow leaf blight and mosaic disease are classed under the general term of rust. They are merely different names for the same malady. Rust is common throughout the state and the loss from this disease is considerable. It is present on worn out and light sandy soils or on soils which contain little or no humus. The disease is very likely to appear on wet poorly drained soils. Unfavorable weather conditions also favor the development of rust. Rust develops in spots in the field and appears year after year unless remedies are applied.

From records in this office, though incomplete at present, we learn that most of the rust is located in a narrow strip through the centre of the state from north to south and as far south as Lamar and Marion counties.

(b) **Symptoms.**—This disease affects the leaves. The first indication of trouble is shown in the yellow mottled appearance of the leaf. The yellow portions are farthest away from the source of food supply, the veins. These latter stay green for a longer time. Being deprived to a great extent of the means of sustenance the leaf in a weakened condition becomes a prey to various fungi which ultimately destroy it. The leaves fall off and sometimes the stalk is entirely bare. Such plants do not set a top crop as a rule and therefore the yield is seriously reduced. The lint is often badly damaged being shorter and inferior in quality.

(c) **Cause.**—The disease is due to unfavorable soil and weather conditions. Thrifty and vigorous plants do not suffer until the food supply is withdrawn. The three important factors to which rust is attributed are (1) lack of humus, (2) lack of potash, and (3) lack of drainage. Heavy rains followed by long droughts cause no injury to the cotton plant if the soil is in a condition of proper tilth and fertility. Let these conditions be reversed and serious outbreaks of rust will follow. Diseases of this class are all called physiological, since they are responsible for the constant interruption of the normal development of the plant.

(d) **Remedies.**—The remedy for rust lies in changing the unfavorable soil conditions and in securing conditions that will support a vigorous growth of the plant.

When land has been cropped to cotton for a long term of years it lacks humus or decaying vegetable matter. This kind of soil needs building up and can be done by plowing in a green crop. A crop of cowpeas or beans are especially good. Barnyard manure is beneficial and will do much to prevent rust. Kainit or potash at the rate of 200 pounds per acre will do equally as well as barnyard manure if the latter is not available. Better drainage of wet lands and seepy hill-sides will also reduce rust.

Red Rust.

Another kind of rust which is often confused with the rust just described is called red rust. The leaves are attacked by a mite which is similar to the red spider. The injury done appears on the leaf and shows itself by a red coloration of a part or the whole of the leaf. In extreme cases this disease causes the complete defoliation of the plant. The trouble is of slight importance. It occurs in new fields as a rule and only in comparatively small patches. Rain checks the spread while dry weather exaggerates the trouble. The insects thrive better in the latter condition. No practical remedy has as yet been found efficient.

Damping-off or Sore-Shin.

(a) **Occurrence.**—Sore-shin, damping-off or seedling rot occurs quite widely throughout the state wherever cotton is grown. It does not very often cause serious loss, though many young plants are killed during cold wet unfavorable springs.

(b) **Symptoms.**—The young plants first show signs of weakness in the stem near the surface of the ground. The turgid cells lose the water they contain and become flabby. At this point the stems bend and the plants fall to the ground. Quite often the plants are only partially affected. This is true of the older plants. One side is marred by a canker or ulcerous depression. Unless these diseased spots interfere seriously with the normal functions of the plant, the latter will partially recover but will never be normal.

(c) **Cause.**—The sterile fungus, **Rhizoctonia**, is usually considered the cause of this trouble. Its natural habitat is the soil.

The disease is sometimes due to the anthracnose fungus or other parasites. Such damping off disease must be clearly distinguished from wilting due to dry soil or dry air. If warm favorable weather prevails, the cotton seedling may outgrow the disease.

(d) **Remedies.**—As the sterile fungus prefers acid soils, and alkaline soils are fatal to its growth it would follow that the addition of lime to the soil would be exceedingly beneficial.

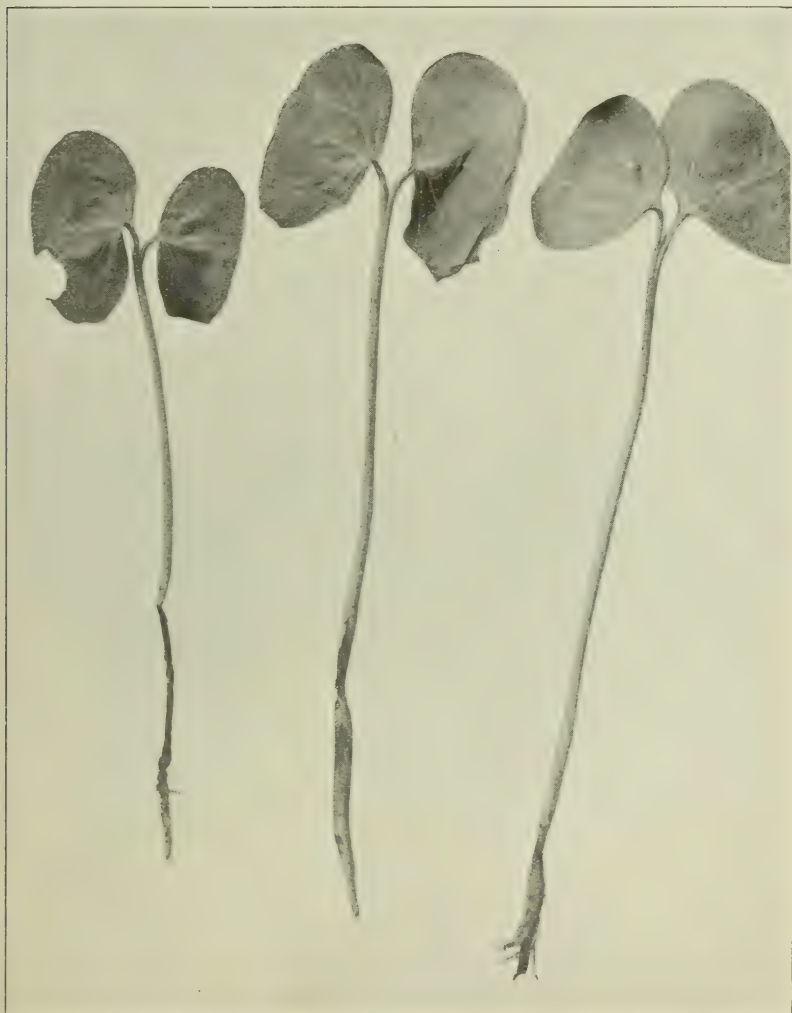


FIG. 4. Sore-Shin or Damping-Off of Cotton (after F. D. Heald).

Bacterial Blight.

(a) **Occurrence.**—This disease is known to attack the stem, boll and leaf. On the stem the trouble goes by the name of black arm;

on the boll, boll-spot; and on the leaf, angular leaf spot. All three diseases are due to one and the same cause, a bacterium or microbe. This blight is probably found in every cotton field during the summer months but only after careful search would one be able to see it. The trouble is not yet of economic importance.

(b) **Symptoms.**—The first appearance of the disease is on the under surface of the leaf. Here one finds green colored, water-soaked, angular areas of varying sizes. Later these spots appear on the upper surface of the leaf, the fungus having grown through the leaf. These spots turn purple and finally become brown. These diseased areas seem to be scattered about the surface of the leaf without any definite arrangement but on closer examination they are found to surround the breathing pores or stomata. The method of infection then is chiefly through these breathing pores.



FIG. 5. Angular Leaf Spot of Cotton (after Dr. E. F. Smith).

The symptoms that appear on the bolls are very similar to those on the leaf. The injury on the stem appears in the form of a canker or ulcer which saps the vitality of the plant. The shedding of bolls is sometimes due to the injury from this bacterium. The stems, bolls and pedicels, like leaves, may weaken and lose vitality. This affords suitable conditions for the invasion of parasitic fungi and bacteria, chief among which is the anthracnose fungus.

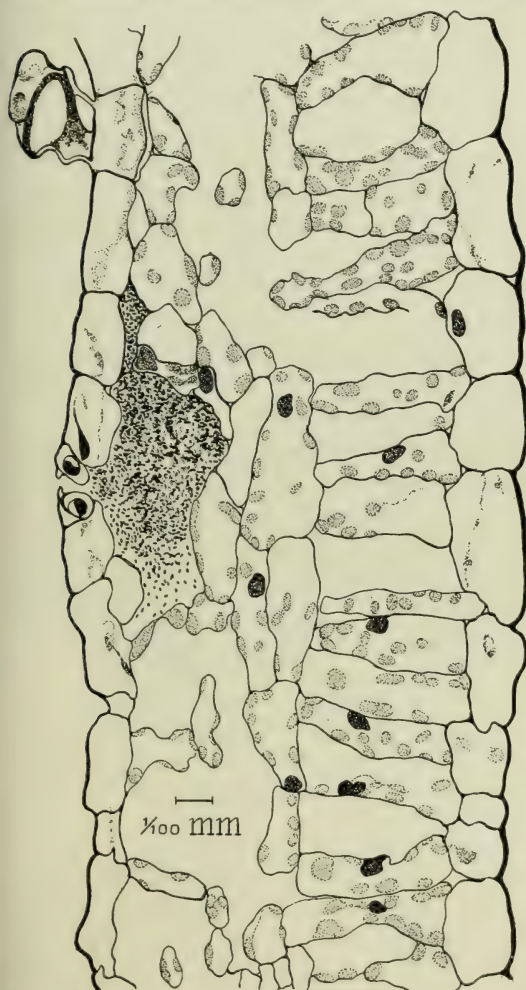


FIG. 6. Angular Leaf Spot of Cotton; bacteria in the tissues of the leaf (after Dr. E. F. Smith).

(c) **Cause.**—In the angular spots on the leaves and the water soaked areas of the bolls countless numbers of microbes are to be found. These were isolated by Dr. Erwin F. Smith of the Department of Agriculture to which he gave the name of *bacterium malvacearum*. The final destruction of the plant is due often to the presence of the anthracnose fungus and certain decay bacteria.

(d) **Remedies.**— There has been little necessity for a remedy and therefore no efficient method has been worked out. The disease usually appears during the time when the cotton is most vigorous and succulent and may be partially checked therefore by so treating the soil that less succulent plants are produced. This can be done by reducing the supply

of nitrogen and increasing the potash content of the soil. It has been suggested that the infection is carried in the seed. The trouble could

then be lessened or checked by the selection of clean, healthy seeds from well matured healthy bolls.

Shedding of Bolls.

(a) **Occurrence.**—Squares, forms and young cotton bolls often fall for other causes than that due to the injury by insects. Not all of the shedding can be attributed to the boll worm or weevil. In many instances no fungus or insect can be found on or in the affected parts. Such shedding is simply an outward manifestation of improper or faulty nutrition and assimilation. The disease is a physiological one. Climatic conditions have much to do with the presence or absence of this trouble. It is quite common in either very dry or very wet weather. It is also present during the change from one extreme to the opposite. If the plants are crowded and the growth rank, sufficient food is not available to supply all fruit forms especially those furthest from the course of supply, consequently many squares fall.

Some varieties of cotton seem to be more susceptible than others. Certain soil conditions have a detrimental influence and aggravate this trouble. Even the character of the fertilizer is said to show a marked effect on shedding. During some seasons the loss by this disease is considerable. Under normal conditions there is also a loss which, however, does not reach an alarming stage.

(b) **Symptoms.**—The symptoms are easily recognized. The parts affected change in color from a deep green to a pale green and finally become yellow. In the majority of cases the forms drop off, yet it is not uncommon to find some attached to the parent plant by a few strands of the peduncle or stalk.

(c) **Cause.**—This disease is a physiological one and cannot be attributed to any one cause. It is rather the result of a series of causes which are constantly changing. Such causes are the unfavorable conditions of climate and soil.

(d) **Remedies.**—Physiological diseases have as yet received little attention at the hands of plant pathologists and for that reason it is difficult to give any reliable remedy. We have no control over climatic conditions and therefore the hope of a suitable remedy lies in the direction of a thorough study of soil conditions. A system of soil preparation, culture and fertilization with a view to affording the best conditions for the development of the plant should do much towards checking this malady.

Root-Knot, Root-galls, Root Nematodes.

(a) **Occurrence.**—Only a few cases of root-knot of cotton in this state have been brought to my attention, yet I am loath to believe that it is not quite common, especially on thin sandy soil and worn out lands. Cotton growers are probably more ignorant of the presence of this disease in their fields than any other. This is likely the true explanation of the lack of satisfactory information on the distribution of this trouble throughout the state. Mr. Orton, of the Department of Agriculture, has found that root-knot of cotton is often associated with wilt. Root-knot so weakens the root system that it affords easy or favorable conditions for the entrance of the wilt fungus. Many weeds and cultivated plants are subject to this trouble. One of our best soil renovators, the cowpea, is very susceptible. It is bad economy to follow diseased cowpeas with cotton.



FIG. 7. Root-Knot on Cotton Plant (after W. A. Orton, Bull. 333, Bur. Plant Industry, U. S. Dept. Agri.)

(b) **Symptoms.**—Root-knot is a disease that attacks the roots or underground parts of the cotton plants. All cotton plants suffering from root-knot are dwarfed. When the roots are badly diseased, the plant suffers a lack of food and water, wilts and finally dies. A plant may not show any striking symptoms but on examining the roots the cause of the disease can be easily determined. They are covered with warts, galls or excrescences of various sizes and shapes, and sometimes are as large as an inch in diameter. When the affected roots begin to die they send out new roots so that before long the root system becomes bushy and tangled.

(c) **Cause.**—This root afflictions is due to a microscopic worm about 1-20 to 1-60 of an inch long. It burrows into the root, thus setting up an irritation which later produces these wart like excrescences or knots. If these knots are numerous the nutrition of the plant is interfered with. It becomes enfeebled and finally dies.

(d) **Remedies.**—No treatment of diseased roots with poisons, is practicable since the amount necessary to kill the worm would also seriously injure the root. Carbon bisulphide, arsenic and kerosene emulsions have been tried without success.

Alkaline fertilizers such as kainit, potash, and lime have been mentioned as good checking agents.

Allowing the land to go fallow for two seasons has resulted in almost ridding the soil of the worm. This method is expensive and unnecessary since there are crops that can be grown on land containing the root-knot organism without receiving any injury. Wheat, oats and rye are examples of such crops.

Clean cultivation which would rid the soil of infected weeds and diseased crops would be of great value in retarding the spread.

The best means of control rest in a proper system of rotation, using crops that are not susceptible, and in this way starving out the nematodes.

Root Rot.

(a) **Occurrence.**—No root rot has been reported to the department as coming from this state. It is found in Texas where it causes a great deal of damage. It has not yet been found east of Texas (1906) but it is likely to spread in this direction. It is a soil fungus and, like its neighbor, the wilt fungus, is liable under favorable conditions to spread rapidly in the ground after it has once established itself. All types of soil are more or less subject to it. The lime soils of Texas, as

well as the black waxy lands which hold moisture so tenaciously have proven the most suitable soils for the development of this trouble.

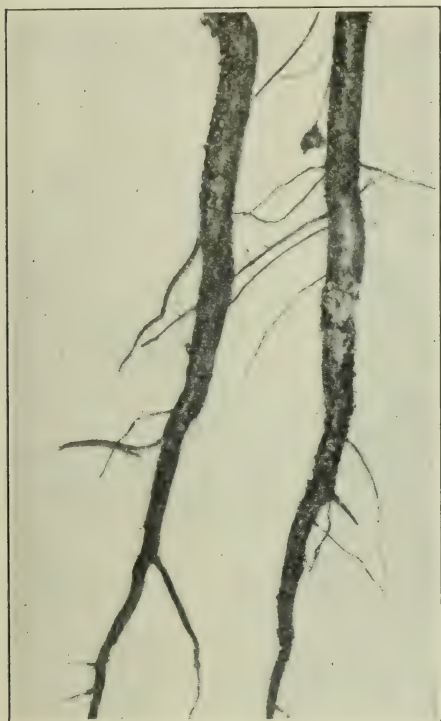


FIG. 8. *Ozonium Omnivorum* on Roots of Cotton (after B. M. Duggar.)

lives in the ground and rapidly spreads throughout the soil. It can enter the roots, through wounds but is perfectly able to penetrate healthy roots. Its strands or mycelia plug up the water conducting vessels and cut off the water and food supply. This fungus remains in the root and unlike the wilt fungus does not extend into the stem.

(d) **Remedies.**—Soil treatment with poisonous substances or fungicides is not an effective means of control. Attempts to breed a resistant variety have failed.

Deep plowing, together with a proper system of rotation seems at present to be the only adequate means of checking this disease Mr. Shear of the Department of Agriculture, advises fall plowing at a

(b) **Symptoms.**—The first indication is a sudden wilting followed by the death of the plant in most cases. The disease usually appears about the latter part of June or the first of July though it can be found at an earlier date and even when the plant is more mature. On pulling up the plant and examining the roots closely a further indication of disease can be noted. The diseased roots are covered with dirty yellowish filaments of the fungus which causes the trouble. Sometimes numerous scars are visible on the roots. The smaller roots are dead and dried up.

(c) **Cause.**—This disease is attributed to the work of a parasitic fungus which

depth of 7 to 9 inches. In addition to this he advises a two or three year rotation with grasses or grains. The deep plowing aerates the soil to quite a depth and offers unfavorable conditions for the development of the fungus which thrives better in a compact soil that lacks air. That this work may be properly done, the cotton mule and ordinary plow will have to be replaced by heavy animals and 12 to 14 inch plows.

Areolate Mildew.

This disease and the one following will be mentioned briefly since they are of slight economic value.

Areolate mildew sometimes called frosty blight from the white snowy appearance of the under surface of the leaf occurs in the late summer and fall, and is found on the rank luxuriant plants growing in moist places. The fungus, **Ramularia areola**, which is the cause of this trouble, produces a partial defoliation of the plant, but as this takes place late in the season there is no appreciable interruption of the normal functions of the plant. This trouble has not proven serious enough as yet to warrant any investigations concerning methods of control.

Cotton Leaf Blight.

This disease is very common on cotton. It is found on the less vigorous or old leaves. It is likely to attack all the leaves of weak plants if the soil is wet and the climatic conditions favorable for the development of the fungus. This trouble affects the leaves by producing spots upon them. These spots are red at first, grow larger centrifugally and later turn brown. Sometimes the centers of these spots are white. This is the case when the spores are abundant. In the last stages of disease the leaves are ragged and full of holes. The fungus **Cecrospora Gossypina**, is the direct cause of this leaf blight. The strand or filaments are found within the plant while the fruiting bodies or spores are produced on the surface.

Mississippi Agricultural Experiment Station

BULLETIN No. 141.

CONTROL OF DISEASES OF FRUITS, VEGETABLES AND FLOWERS.

By H. C. THOMPSON.

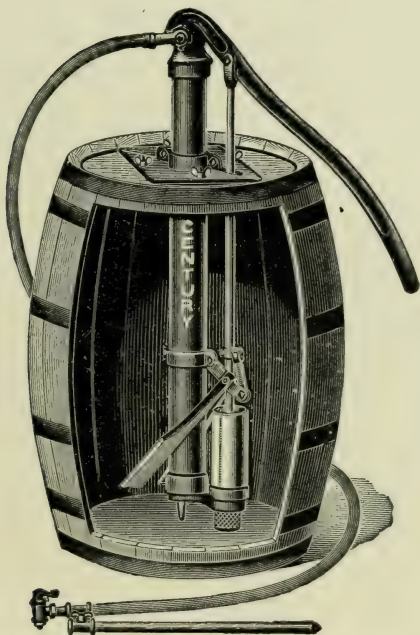
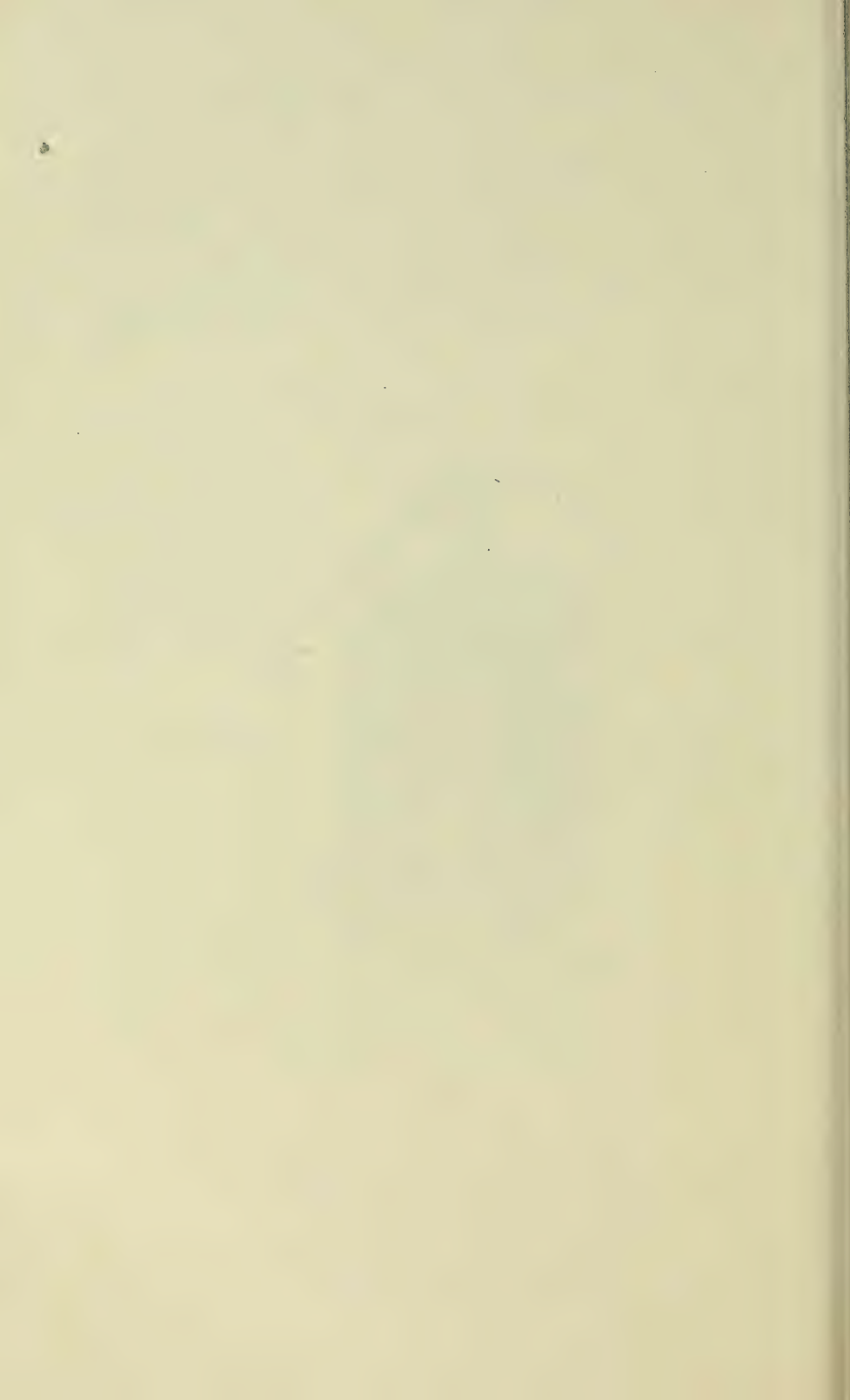


Fig. 1.—A good type of barrel pump with paddle agitator. This is the most economical kind to use for a small orchard or garden. (Deming.)

AGRICULTURAL COLLEGE, MISSISSIPPI.

JUNE, 1910.



CONTROL OF DISEASES OF FRUITS, VEGETABLES AND FLOWERS.

Introduction.

This bulletin is written for the farmers, fruit growers and truck growers of Mississippi to answer the question as to how to successfully combat diseases. The attempt is not made to give remedies for all diseases of all our cultivated plants, but to give those of most economic importance. Considerable space is given to a discussion of apple diseases, not because the apple is an important crop, but with the hope that the cultivation may be extended to all parts of the state, especially for home use. Without proper protection from diseases, none of our common fruits will reach perfection and in some cases will amount to almost nothing.

The boll weevil will undoubtedly drive many cotton planters to growing other crops on the farm and the truck and fruit crops will come in for some recognition. Knowing that successful fruit or vegetable culture is dependent upon a rational system of protection against diseases, we hasten to answer the questions that will be asked. Fruits and vegetables cannot be grown satisfactorily without some knowledge of their enemies and methods of control. Spraying is the only practical way to keep these in check and some knowledge of this operation is absolutely essential. No phase of horticultural practice pays greater returns for money invested and none is more essential. The difference between spraying and not spraying means, in most cases, the difference between profit and loss. The work properly done at the right time often pays 500% on the cost of application.

Spraying has passed the experimental stage and is practiced by all up-to-date horticulturists. The fruit grower should know the common diseases and insects that affect his plants, should know their habits and life history, so as to know what treatment to use and at what stage in the life of the organism. Too much emphasis cannot be placed upon the necessity of doing the work at the right time with the proper solution and thoroughness of application. The most successful applications for diseases are made before the diseases appear because the remedies are preventatives rather than cures. The vegetative portion of the fungus producing the disease grows within the tissue of

the host plant and cannot be reached after it has obtained a foothold. Proper application of a fungicide will, however, prevent the spread of the disease to other plants. The best time to spray for diseases, therefore, is about the time the spores are ripening and being distributed.

Kinds of diseases.—There are two general classes of diseases. (1) Fungus diseases are those caused by the growth of fungi, which are small parasitic or saprophytic plants. (2) Bacterial diseases are those caused by the growth of bacteria. Under the first head are most of the common diseases, as the bitter rot, of the apple, brown rot of the peach and plum, apple rust, apple scab, potato scab, cucumber anthracnose and mildew, etc. These can be successfully kept in check by spraying. Under the second head, are such diseases as pear blight or fire blight of the apple and pear. This cannot be controlled by spraying because all of the growth is within the host plant.

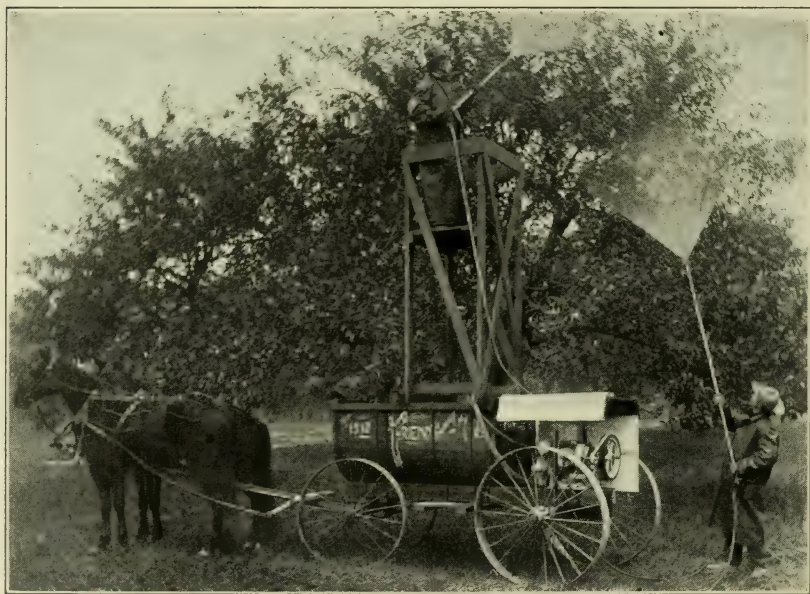


Fig. 2.—One of the best types of power sprayers, with all necessary appliances. (Friend Mfg. Co.)

Spray pumps and appliances.—There are all sizes of spray pumps on the market from the small hand or bucket pumps to the large power sprayers and the individual must decide for himself which one to buy. The author does not recommend anything smaller than the barrel pump for ordinary garden use. One similar to the one shown in Fig. 1

is very satisfactory and can be secured from most any of the dealers mentioned in the list and the cost will not exceed \$25.00. For an orchard or garden of several acres, a power spray of some kind is most economical and one similar to the one shown in Fig. II is very satisfactory. These power sprayers give a uniform high pressure and better work can be done with them than with the smaller machines. The working parts of the pump should be of brass and the valves should be easily accessible.



Fig. 3.—Bamboo extension rod, light and convenient to handle. (E. C. Brown Co.)

The discharge hose should be at least 25 feet long and of best make. Nothing less than a four-ply hose is recommended because the high pressure bursts the cheaper hose. For spraying trees, an extension rod is necessary. The best rods are made of light brass fitted with light bamboo and should be about ten feet in length. See Fig. III. Small iron pipe is sometimes used but it is heavier than bamboo. The end of the hose where it connects with the extension rod should be provided with a stop cock to prevent waste of spray material when going from one tree to another, or when the nozzle gets clogged. One with one-quarter turn is best.

Nozzles.—No part of the spray outfit is any more important than the nozzle for upon them depends the economic and effective performance of the work. The object in spraying for fungus diseases is to thoroughly cover the surface with the least amount of liquid possible and this is secured by using nozzles which produce a fine spray. None have given greater satisfaction than the nozzles of the Vermorel type. In spraying for the coddling moth a coarser spray is better, for the object is to fill the calyx of the small apple with the poison. To secure this, a high pressure and nozzle which gives a coarse spray is best. The Bordeaux and Vermorel with the large opening in the cap are very satisfactory. Many of the nozzles have movable caps with various size openings. A large opening is from 1-16 inch to 1-10 inch, and a small from 1-32 inch to 1-24 inch. For most spraying a cluster of two or three nozzles is used on each hose, unless some of the larger nozzles are used. All of the manufacturers and dealers of spraying machinery and appliances have good nozzles of the various types and there are a good many new types on the market.

Spray mixtures.—Any mixture used for plant disease is called a fungicide and the active principle in most fungicides are copper and sulphur. Copper sulphate is the most common compound used and the mixture most generally employed is Bordeaux Mixture.

FORMULAE AND METHODS OF PREPARATION.

Standard Bordeaux, 4-4-50.

Copper Sulphate.....	4 lbs.
Lime (unslaked).....	4 lbs.
Water	50 gallons

This is used for all outdoor plants except peaches and plums when in leaf.

Weak Formula, Bordeaux, 2-2-50.

Copper sulphate.....	2 lbs.
Lime (unslaked).....	2 lbs.
Water	50 gallons

Used on peaches and plums when in leaf and on cucumbers in greenhouses.

The copper sulphate is dissolved in a wooden or stone vessel by suspending in a bag in the top of the water. After dissolving it is diluted to 25 gallons. The lime is slaked in another vessel and diluted to 25 gallons. The two liquids are poured together and stirred vigorously and strained into the spray tank so as to get out all particles which would clog the nozzles. To test the Bordeaux, use a clean steel blade knife; dip it into the liquid and if it comes out coated with copper, more lime should be added. If the blade comes out clean the mixture is properly made. Bordeaux should never be used when the fruit is ripening because it spots the fruit.

Ammonium copper carbonate.

Copper carbonate.....	5 oz.
Ammonia (about 26" Baume).....	3 pts.
Water	50 gallons

Dissolve the copper carbonate in the diluted ammonia. Just enough ammonia should be used to dissolve the copper carbonate. Dilute to 50 gallons. This is used when fruit is maturing in place of the Bordeaux mixture.

Copper sulphate solution.

Copper sulphate.....	2-2½ lbs.
Water	50 gallons

Dissolve the copper sulphate and dilute to 50 gallons. Used on trees in a dormant condition as it would burn the foliage if applied when the trees were in active condition.

Formalin for potato scab.

Formalin (40% strength).....	1 pt.
Water	30 gallons

Soak potatoes in solution for two hours and pour out to dry. Bags of potatoes may be put in barrel containing mixture or the potatoes may be poured in and the mixture drawn off by a faucet into another vessel.

Sulphur.—Sulphur is used in the greenhouse for many diseases. It may be evaporated over a flame, but it must not burn or the flowers will be killed. The most common method is to make into a paste and smear on heating pipes.

Lime-sulphur mixtures as fungicides.—While Bordeaux mixture is the best fungicide known for all classes of fungus diseases growers have complained about the injury it does to foliage and fruit, especially of peach and plum. During the past few years experimenters have been trying to find a substitute, which will be as effective as Bordeaux without injuring the plants. The work of the U. S. Department of Agriculture and a few experiment stations seem to indicate that the Lime-sulphur mixtures fill these requirements.

Mr. W. M. Scott, of the U. S. Department of Agriculture, has been working with self-boiled lime-sulphur, and the results the past three seasons show that it is an effective fungicide for peach brown rot and peach scab. Other experimenters have had the same success with this mixture and also with the concentrated boiled washes, either home-made or commercial. Experiments carried on in Missouri and at Cornell show that the apple scab can be controlled with any of the lime-sulphur mixtures, without any injury to the foliage, but the boiled mixture is more effective than the self-boiled. At Cornell a commercial mixture was used, and the results would seem to indicate that it is effective.

While the lime-sulphur sprays have been used only a short time as a fungicide the writer believes that they should be used in prefer-

ence to Bordeaux because of the danger of injuring the fruit and foliage by Bordeaux.

Preparation of self-boiled lime-sulphur.

Flour of Sulphur.....	8 lbs.
Lime (unslaked).....	8 lbs.
Water	50 gallons

Mr. Scott has the following to say: "The mixture can best be prepared in rather large quantities,—say enough for 200 gallons at a time, making the formula 32 pounds of lime and 32 pounds of sulphur, to be cooked with a small quantity of water (8 or 10 gallons), and then diluted to 200 gallons.

The lime should be placed in a barrel and enough water poured on to almost cover it. As soon as the lime begins to slake the sulphur should be added after first running it through a seive to break up the lumps. The mixture should be constantly stirred and more water added as needed to form a thick paste at first and then gradually a thin paste. The lime will supply enough heat to boil the mixture several minutes. As soon as it is well slaked, water should be added to cool the mixture and prevent further cooking. It is then ready to be strained into the spray tank, diluted, and applied." See bulletin 174 of Bureau of Plant Industry, U. S. Department of Agriculture.

Concentrated lime-sulphur (boiled).

Flour of sulphur.....	16 lbs.
Lime (unslaked).....	20 lbs.
Water	50 gallons

Mix the sulphur into a thin paste. Slake the lime in from 5 to 10 gallons of water. If the lime is good it will boil violently and the sulphur paste may be added to take advantage of the heat from the lime. After the sulphur is added dilute to 20 or 25 gallons and boil for 45 minutes or longer or until it becomes a clear amber color. The mixture may be cooked in a large kettle over a fire or by using steam pipes in a barrel or tank. For treatment of scale insects in winter dilute to 50 gallons and apply while hot. For treatment of diseases when the trees are growing dilute this to 200 gallons. This point cannot be urged too strongly for if the concentrated mixture was used in summer it would kill the trees.

Commercial lime-sulphur.—There are a number of commercial mixtures which have given satisfactory results and when only a few trees are to be treated the grower would be justified in using them

instead of home-made preparations. They are more expensive but they are ready to apply as soon as diluted with the proper amount of water. Among the brands that have given good results are "Orchard Brand" lime-sulphur, "Rex" lime-sulphur and "sulfocide."

Combined fungicide and insecticide.—By using a poison with the fungicides, insects can be controlled at the same time that the plants are treated for diseases. In the combined treatments recommended for the various crops both insects and diseases are considered and the treatment suggested will control both if properly applied.

Bordeaux and Paris Green for Irish potatoes.

Paris Green.....	8 ozs.
Bordeaux	50 gallons

Bordeaux and arsenate of lead.

Arsenate of lead.....	2-3 lbs.
Bordeaux	50 gallons

For peach.

Arsenate of lead.....	1½-2 lbs.
Bordeaux	50 gallons

The Paris green should be thoroughly mixed with a small amount of water before put in the mixture. Make the arsenate of lead into a thin paste and pour into the spray tank.

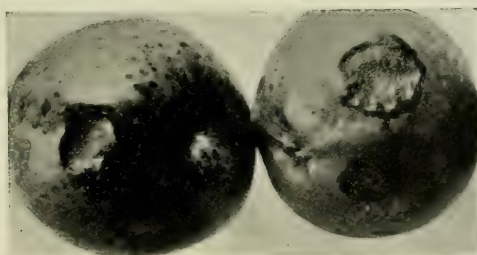


Fig. 4.—Bitter Rot of Apple. Spray with Bordeaux mixture late in the season. (Va. Expt. Sta.)

DISEASES OF THE APPLE.

Bitter rot.—This disease known as bitter rot or ripe rot, is a disease of the ripening fruit and in another form produces a canker on the limbs of the tree. On the fruit the rot produces at first a slight discoloration and this increases until it becomes sunken, and on the

surface of the diseased portion are rough postules. This disease usually appears when the apples are about half grown and forms rotten spots on the surface which narrow in toward the core in the shape of a cone. It is supposed that the disease passes through the winter on the dried mummy fruits and on cankered limbs. See Fig. IV.

Treatment.—Remove all mummy fruit and cankered limbs and spray with Bordeaux as soon as it appears and continue at intervals of about two weeks until the fruit begins to ripen, then use ammonium copper carbonate solution if the disease persists.

Apple scab.—This is one of the most common and destructive diseases of apples and pears. It appears on the leaves and fruit early in the season as blotches. Fruit attacked early usually falls prematurely. On matured fruit it forms scabby blotches and injures the appearance of the fruit. It lives over winter on dead leaves, and these should be destroyed or plowed under. Spraying with Bordeaux mixture will keep this in check if applied at the proper time. Spray before the buds open with the copper sulphate solution and spray with the Bordeaux at intervals of ten days or two weeks. These later sprayings may also be made for insects and other diseases by using Bordeaux and arsenate of lead.



Fig. 5.—“Cedar Apple,” the winter stage of Apple Rust on common red cedar. Remove all cedars from vicinity of orchard. (Va. Expt. Sta.)

Apple rust.—This disease is very peculiar in having two host plants the apple and the common red cedar, and forms the well known “cedar balls” or “cedar apples.” The winter stage is on the cedar and in the spring on the approach of warm weather the spores ripen on the horns of the cedar apple and are carried by wind to the apple tree. When they fall on an apple leaf, they germinate and form yellowish spots on the under side of the leaf and in severe cases the foliage turns yellow and drops prematurely and this prevents proper development of the fruit. See Figs. V and VI.

Remove all cedar trees near the orchard or pick off and destroy the cedar apples. Spray with Bordeaux mixture about the time that



Fig. 6.—Apple Rust or Orange Rust of Apple, showing summer stage on apple leaves. (Va. Expt. Sta.)

the cedar balls become gelatinous, which is the time that the spores are ripening.

Brown rot.—This disease usually starts in a decayed place near the stem end, but sometimes near the blossom end of the fruit. This decayed area turns black and the fruit finally shrivels up and becomes a “mummy.” It also affects the leaves and appears as irregular brownish spots and causes cankers on the branches and all such branches should be removed and burned. Spraying with Bordeaux as recommended for the apple scab and bitter rot will keep it in check. Decayed and

mummy fruits should be gathered and destroyed as they are sources of infection.

Pear blight or fire blight.—(See under Pear.)

Combined treatment for apple:

1. Spray with lime-sulphur during winter if scale insects are present.
2. Spray with copper sulphate solution before buds open if the lime-sulphur spray is not given.
3. Spray with Bordeaux and an arsenical after leaf buds are open but before flower buds appear.
4. Spray with Bordeaux and an arsenical after blossoms fall.
5. In about two weeks give another spraying with Bordeaux and an arsenical if necessary. Repeat if necessary.

If it is necessary to spray up until the fruit begins to ripen use ammonium copper carbonate solution.

CHERRY.

Black knot.—(See under Plum.)

Leaf spot.—This disease affects the cherry and plum and appears as purplish spots on the leaves. The diseased spot often falls

out giving the shot-hole effect and is sometimes called the "shot-hole disease." All the leaves may fall prematurely and this prevents proper development of the fruit of the plum.

Spraying with Bordeaux will keep the disease in check. Make first application before the blossoms open, but after the leaves are out, and another application in about two weeks if necessary.

Brown rot.—(See Peach.)

Combined treatment for cherry.—(Same as for peach or plum.)

DISEASES OF THE GRAPE.

Black rot.—This is one of the most destructive disease of the grape and attacks all parts of the vine except the roots, but on the fruit it



does greatest injury. The first appearance is on the leaves and young shoots where it appears as brownish spots. The fruit may be attacked when half grown but the greatest destruction is following a warm, moist period just before ripening. The affected fruits first show dark spots which spread rapidly and may include the whole berry. The fruit dries up and usually remains on the vine, and these produce spores which remain dormant through the winter and serve as a source of infection in the spring. See Fig. VII.

The dried grapes and leaves should be gathered and burned or plowed under, and all prunings from the vine should be burned. Spray with Bordeaux just before the blossoms open and at intervals of two or three weeks until the fruit is about half grown then use ammonium copper carbonate.

Fig. 7.—Black Rot of Grape. Pick off and destroy mummy fruit and spray with Bordeaux. (Ta. Expt Sta.)

Downy mildew.—This is a common disease and chiefly affects the foliage, forming brownish spots above and whitish, downy spots on the under surface, from which it gets its name, "downy mildew." Young shoots and fruit may also be affected. The disease on the fruit produces brownish spots and is sometimes known as "brown rot."

The treatment for the black rot will keep the downy mildew in check. Collect and burn leaves where the disease is found in the vineyard.

Powdery mildew.—This disease is not likely to be so troublesome as either the black rot or the downy mildew. It forms mouldy or powdery growths on the upper surface of the leaf and can be distinguished from the above in this way. Late in the season black fruiting bodies are found on the surface of the leaf.

Spray as for black rot with one additional application with Bordeaux after fruit is gathered to kill the winter spores.

Combined treatment for grape:

1. Spray with copper sulphate solution while dormant.
2. Spray with Bordeaux mixture and arsenate of lead or Paris Green before the blossoms open.
3. Spray with Bordeaux after fruit has set.
4. Repeat at intervals of two weeks until fruit is half grown, then use ammonium copper carbonate.

PEACH.

Brown rot.—The brown rot is the most destructive disease of the peach in this section of the country. It affects the peach, plum, and

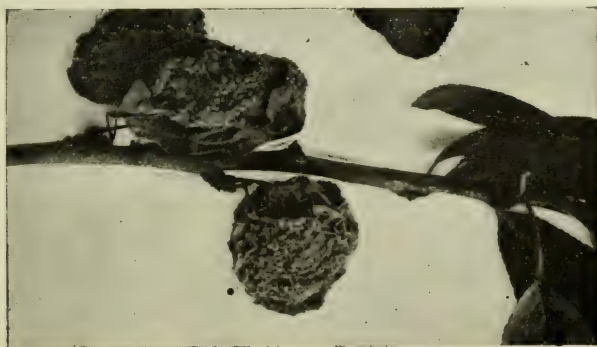


Fig. 8.—Brown Rot of Peach. The disease lives over winter in these mummies. Pick and destroy these and spray with Bordeaux or self boiled lime-sulphur. (Va. Expt. Sta.)

cherry, and causes great losses. It is estimated that the loss in the state of Georgia in 1900 from this disease was 40% of the crop or the loss of over half a million dollars. It thrives best in warm, moist weather and under favorable conditions may affect the flowers. The disease may affect the twigs and is often referred to as "twig blight." On the fruit the disease forms small brown spots and the fruit either falls to the ground or remains on the tree as "mummy peaches". (See Fig. VII), so commonly seen in the winter. These form centers of infection in the spring. Fruit should be thinned so they do not touch. Gathering all diseased peaches and destroying them and spraying with Bordeaux and arsenate of lead will keep this disease in check. It has been observed that it is practically impossible to completely control brown rot with fungicides alone, but by getting rid of plum curculio by spraying with arsenate of lead the disease is not serious. The puncture made by the plum curculio gives chance for the brown rot spores to enter. Experiments carried on by Prof. Taylor of the Missouri Fruit Station show that spraying thoroughly with arsenate of lead for the curculio practically controls the brown rot, but the writer advises the use of either Bordeaux or self-boiled lime sulphur along with the arsenate of lead.

Spray:

1. Just after the blossoms fall with arsenate of lead.
2. About two weeks later with Bordeaux and arsenate of lead.
3. Apply Bordeaux at intervals of ten days or two weeks until the fruit begins to color. Self-boiled lime-sulphur might be used instead of Bordeaux.

Crown gall.—This is a disease of trees in the nursery row. It forms knotty galls on the lower part of the trunk and roots and is usually very easy to detect and trees affected with this disease should never be planted.

There is no safe remedy, but all trees affected should be burned, for if they are allowed to grow they will be a source of infection and never will be thrifty trees. This disease affects most all of our fruit trees, but seems to be worse on the peach than any other tree.

Leaf curl.—This disease is very wide spread, being found practically everywhere the peach is grown and the loss for this disease has been estimated to be as high as \$3,000,000 in a single year. It appears as soon as the buds begin to open and shows a characteristic curling of the leaves and deeper green color. (Fig. IX.) The twigs are also affected and become swollen and have a lighter color. The fungus lives

from year to year in the twigs and the infection in the spring is probably from them.

Spraying as for the brown rot will keep this in check. The self-boiled lime-sulphur wash is said to be especially valuable for this disease.



Fig. 9.—Peach Leaf Curl. Winter spraying with lime-sulphur for San José scale checks this disease. (Va. Expt. Sta.)

Trees sprayed for the San José scale need very little additional treatment for the leaf curl.

Rosette.—This disease is not known to affect the peach in Mississippi but in Georgia has attracted considerable attention. It appears as compact tufts or rosettes. The cause of the disease is unknown and there is no remedy except to dig up and destroy the tree.

Yellows.—The yellows, like the rosette, is not known to be present in this state, but is a serious disease of the peaches in most peach growing districts. It is the most destructive disease of the peach where it is present. The cause is unknown and there is no remedy except to dig up and destroy the infected trees. It appears as a yellow discoloration on the leaves and causes premature ripening of the fruit and the death of the tree.

Combined treatment:

1. Spray with lime-sulphur if San José scale is present.
2. If lime-sulphur is not used, spray with copper sulphate solution before buds open.
3. Spray with weak Bordeaux and an arsenical when fruit has set.
4. Repeat 3, 10-14 days later.
5. Repeat 3 about one month before fruit ripens.

Ordinarily where San José scale is not present three or four sprayings will be sufficient.

PEAR.

Pear blight, twig blight, or fire blight.—This is the most serious pest of the pear and affects the apple also, and is the cause of the great loss of pear trees in this state. This is a bacterial disease which is supposed to be carried by insects from infected trees to those not affected. It usually starts at the tips of the branches and causes the leavaes and twigs to die,—giving the appearance of being scorched, hence the name, “fire blight.” Some varieties of pears are somewhat blight resistant while most varieties succumb in this section. The Keiffer is about the only variety that can be grown in Mississippi because of this disease.

Treatment.—This disease cannot be controlled by spraying as the bacteria or “germs” are within the tissue or the sap. It can be held in check by judicious pruning. Since it enters through the blossoms, all the fruit spurs should be removed from the large branches and main trunk as they would be as likely to be affected as the smaller branches if the spurs remained. The blighted portions of the branches should be removed and the cut should be made 8-12 inches back of the dead portion and the pruning shears should be disinfected by passing through flame or a solution of carbolic acid to prevent carrying the bacteria to uninfected plants. The prunings should be gathered and burned. The blight develops most rapidly on fast growing trees so they should not be heavily fertilized, especially with nitrogenous fertilizers. Pruning off all fruit spurs on the main branches will prevent the disease from entering them and this is essential because they cannot be removed without severely injuring the trees.

Pear scab.—The pear scab is very similar to the apple scab and is kept in check by the same treatment. (See under Apple.)

Leaf blight.—This disease must not be confused with pear blight or twig blight for it is a very different disease,—being caused by a fungus growth. It causes a premature discoloration of the leaves and frequently causes the fruit to crack. On the leaf the diseases appears as small reddish spots and these may unite and extend over the whole leaf and may cause them to fall prematurely. It sometimes affects the twigs, forming a sunken spot on the bark.

Fallen leaves should be raked up and burned.

Bordeaux mixture will keep the disease in check if applied at the proper time. The application should be made as follows:

1. When the leaves are about half grown.
2. At intervals of two weeks until three additional sprayings are given, using ammonium copper carbonate at the last spraying to prevent discoloration of the fruit.

Combined treatment for the pear:

1. Spray with lime-sulphur wash in winter if San José scale is present.
2. If spraying No. 1 is not given, spray with copper sulphate solution before the buds open.
3. Bordeaux and an arsenical just before the blossoms open.
4. Bordeaux and an arsenical within a week after the blossoms drop.
5. Repeat in ten days or two weeks.
6. Spray with Bordeaux alone at intervals of two weeks if necessary to check scab and leaf blight until fruit begins to ripen, then use ammonium copper carbonate.

PLUMS.

Black knot.—This disease is one of the most serious of cherries and plums. It forms the rough, wartlike, knotty growth on the branches. See Fig. X. The first appearance is on the young growth as irregular, knotty swellings, which possess at first a dark olive color

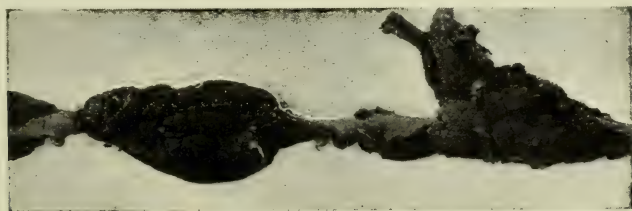


Fig. 10.—Black Knot of Plum and Cherry. Remove and burn diseased branches and spray with Bordeaux or self-boiled lime sulphur. (Va. Expt. Sta.)

due to the number of spore-bearing stalks which grow out on the surface. These spores are scattered by the wind and rain and affect other branches. The fungus starts in the spring from the winter spores which live over in the knots.

Treatment.—All twigs should be removed after the leaves fall to prevent the production of winter spores and all knots formed during the summer should be removed. If these knotty branches are cut off

and allowed to remain on the ground the spores may ripen and spread the disease. They should be burned immediately after being removed.

Canker.—This is a very serious disease in some sections of the south, and is probably found in this state. It usually follows a wound or attack of brown rot or gummosis. The disease appears on the branches as cankered spots and the fungus works in the tissue.

The best treatment is to spray thoroughly for brown rot and plum pockets, and avoid injuring the tree. Remove and burn cankered branches. ■

Plum pockets.—This is a rather peculiar disease living over winter in the twigs and growing out into the ovary in the spring causing a distorted growth. The plum is usually considerably swollen and distorted and often forms a sort of pocket on one side. No seed is produced in the plum affected by plum pocket. It also affects the leaves and twigs. No remedy has been found very satisfactory, but Bordeaux mixture would probably reduce the amount of the disease. All diseased fruit, twigs and leaves should be removed and burned.

Brown rot.—(See Peach.)

Crown gall.—(See Peach.)

Combined spraying for plum:

1. Spray with lime-sulphur before buds open if infested with San Jose scale.
2. If lime sulphur is not used, apply copper sulphate solution just before buds open.
3. Just after blossoms fall, apply Bordeaux and arsenate of lead,—weak formula. Repeat in ten days or two weeks.
4. Apply Bordeaux at intervals of two weeks, if necessary, for brown rot.

Self-boiled lime-sulphur wash may be substituted for Bordeaux.

DISEASES OF STRAWBERRY.

Leaf spot.—This is the most serious disease of the strawberry. It appears as small purplish spots on the leaves and these increase in size and the center of the spot turns to a bright reddish brown color. The leaves usually die, and in the autumn give rise to resting spores which carry the disease through the winter. In the spring these spores become active and start the disease.

None but healthy plants should be set out and the disease-infested patch should be burned over to prevent infection of new plantings.

Spray newly set plants or bearing patch with Bordeaux when new foliage appears and again after the fruit is picked. Mowing and burning the leaves after the fruit has been gathered has been found to reduce the disease.

DISEASES OF VEGETABLES.

ASPARAGUS.

Asparagus rust.—This disease is very similar to the rust of grains. It produces reddish or black spots on the plants and often causes considerable damage. Cut out and burn all infected plants, and after the cutting season spray with Bordeaux. Cut down and burn all the plants in the fall. Fertilize and keep the plants in a healthy growing condition.

BEAN.

Anthracnose or "pod spot."—This is the the most serious enemy of the bean and can be found in most any patch of beans. It affects the leaves, stems, and pods, but is most noticeable on the pods where it forms brown, sunken areas which turn darker with age and have reddish margins. See Fig. XI. On the leaves, it affects the veins, producing spots similar to those on the pods. The mycelium often enters the seed of the bean and may remain dormant for a long time if the beans are kept dry, then when they are planted the mycelium will grow and produce spores which will affect other plants. The spores are held together by a gelatinous substance which is readily dissolved by moisture, therefore, are readily distributed after a rain or heavy dew.

Methods of control.—Since this disease lives over winter in the seed, such seed should not be planted. Seed from an infected fields should not be used if others can be secured; if not, select pods which have no disease. Do not cultivate or enter the patch for any purpose while the plants are moist for the spores are readily distributed then. They adhere to the clothing and may be carried to uninfected plants by this means or by cultivating implements. It is recommended that the farmers and gardeners in Mississippi grow their own seed by planting in the fall for seed to plant in the spring.

Bordeaux mixture, if thoroughly and properly applied, will undoubtedly aid in keeping the disease in check, but must not be relied upon entirely. Affected plants, especially when very young, should be pulled up and burned to prevent spread of the disease.



Fig. 11.—Bean Anthracnose. Do not cultivate while vines are wet; use clean seed and spray with Bordeaux. (W. Va. Expt. Sta.)

Bacterial blight or bacteriosis.—This is a bacterial disease which attacks both lima beans and common garden beans. The disease appears on the leaves as small yellowish spots which increase in size and gradually turn brown in the center of the spot. Affected leaves remain on stalk until completely dead and then the ends of the petioles become affected and often extends back into the branches of the plant and to other leaves and pods. This disease need not be confused with the anthracnose because the diseased areas are not sunken in bacteriosis.

Treatment.—The disease is caused by bacteria which live over winter in the dead leaves and vines. These should be burned where

disease is present. Insects spread the disease so efforts should be made to keep them in check and thus prevent the spread to uninfected plants.

CABBAGE, CAULIFLOWER AND COLLARDS.

Club root.—This is about the only serious disease of these plants. It is caused by a species of slime mould which produces knot-like



Fig. 12.—Club Root of cabbage and related plants.
Due to growth of a slime mold. Lime land and
rotate crops. V(a. Expt. Sta.)

growths on the roots. The disease germs often become established in the soil where they will live for a time, but will eventually die if no plants are present upon which to feed. Rotation of crops is one of the best remedies. Never set out plants in soil infested with this disease and not use plants from an infested bed. Pull up and destroy diseased plants. Lime applied at the rate of about 80 bushels to the acre will aid in keeping this disease in check.

CELERY.

Leaf-blight and leaf spot.—These two diseases are quite similar and will be treated together. They produce rusty, brown, irregular spots on the leaves and often cause considerable damage to the celery crop. The foliage turns yellow and finally dies. Spraying with Bordeaux mixture will keep these diseases in check and the application should be made while the plants are in the seed bed and kept up at intervals until the celery is banked.

Damping off.—This disease is caused by a fungus growth which attacks the young plants in the seed bed. It affects all kinds of young plants and is the most serious disease of the seed or cutting bed. It forms a web like growth over the plants in severe cases and the plants rot off just at the surface of the ground. It is promoted by the excessive heat and too much water or insufficient air and light and by the presence of organic matter in the soil. Remove affected plants and withhold water especially on cloudy days. Thin plants so they will not mat together and give plenty of air and light.

CORN.

Smut.—The black-sooty growth appearing on the ears is caused by this disease. The black powdery mass which flies out when the stalk is jarred is the spores. If only a small area of sweet corn is grown, the



Fig. 13.—Perfect fruit on a sprayed tree (pile on left) and on an unsprayed (pile on right), both young trees. Results of a single spraying with arsenate of lead for codling moth. (Va. Expt. Sta.)

diseased plants should be removed before the spores are ripe. Avoid planting on land heavily manured and select varieties which are somewhat resistant.

CUCUMBER.

Downy mildew.—This is the most destructive disease of cucumbers and melons but is especially injurious to the cucumber. The first appearance in the fields is the yellowing of the leaves in the center of the plant, then spots begin near the veins. The disease spreads rapidly from the center outward to the tips in warm moist weather and the leaves appear as if scorched. This is also very destructive to cucumbers in the greenhouse.

The disease is caused by a fungus closely allied to the downy mildew of grapes and other plants. So far as known there are no resting spores which carry the disease over winter, but the disease may spread from the field to the green house and back to the field again in the spring. It lives through the winter in the south and probably gradually immigrates north in summer, reaching New York in August. Any check to the growth is favorable to the attacks of the downy mildew so that liberal fertilizing and thorough cultivation will aid in keeping this in check.

Spraying with Bordeaux mixture has been found to be very effective. Make the first application as soon as the vines begin to run and spray at intervals of one to two weeks, the aim being to keep the vines thoroughly covered with the mixture.

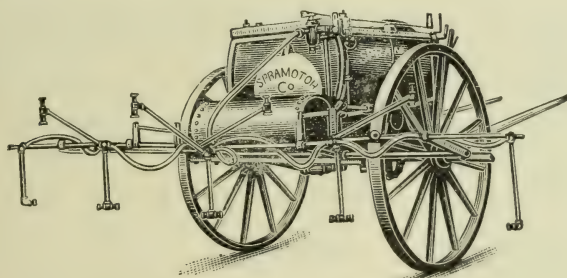


Fig. 14.—Geared compressed air sprayer for spraying potatoes and similar crops in rows. Air pump geared to axle of cart. (Spramotor Co.)

Leaf blight.—This disease begins as small, roundish spots and soon the leaf curls up at the edge and dies in a few days. It is probable that the disease lives over winter in the old vines or in the soil as it is observed to be worse in the fields planted in melons or cucumbers year after year. The leaf blight hastens the maturity of the fruit and in

damp warm seasons, causes great injury. The past season the writer saw large fields in which the yield was diminished by half because of this disease. There were car loads of musk melons about half grown and the vines were completely dead.

Destruction of vines, rotation of crops and spraying as recommended for the downy mildew will keep the leaf blight in check and will give large returns for the work.

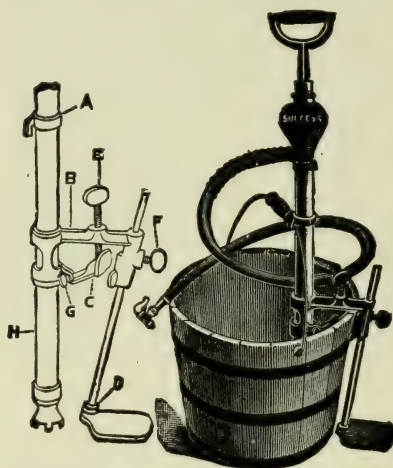


Fig. 15.—Bucket pump, a very simple pump for use only in a small garden. Costs about \$2.00. (Deming.)

Anthracnose.—Anthracnose is found on leaves and stems of cucumbers and musk-melons, and on the leaves, stems, and fruit of water-melons. On the leaves it forms angular spots and on the stems and fruit it forms irregular sunken areas. The common sunken spots on the water melon is due to this disease. The fungus causing this disease is closely related to the fungi causing anthracnose of cotton, beans, bitter rot of apples, etc. It probably lives over winter in the vines. Destroy vines and rotation of crops are recommended.

Spraying as recommended for the downy mildew will aid in keeping the anthracnose in check.

(See Farmers' Bulletin No. 231 for further discussion of the diseases of cucumbers and melons.)

EGG PLANT.

(See Tomato.)

LETTUCE.

Lettuce grown out of doors in a good, well-drained location rarely suffers from disease. In the greenhouse, two or three diseases are sometimes troublesome.

"Damping off".—A disease of seedling plants in which they rot off at or near the surface of the ground. (See under Celery.)

Downy mildew forms mouldy or downy growth on the leaves and gives them a frosted appearance. High temperature and too much moisture are conditions favorable to this disease. Under glass have

good ventilation and do not keep the soil soaked. Plant in well drained soil out of doors.

Drop or rot.—This disease is sometimes quite serious, especially in the greenhouse, and is hard to control. The stems and leaves wilt and rot off at the surface of the soil, the whole plant dying. Care in watering and proper ventilation will keep this disease in check. Sterilizing the soil in greenhouses by passing live steam through it will prevent the drop.

MUSKMELON.

(See Cucumber.)

ONION.

Smut.—Smut is often a very destructive disease of the onion. It appears as black dusty powder on various parts of the plants, and is especially injurious to seedlings. The fungus lives over in the soil, hence rotation of crops is the best remedy, but if it is necessary to use infested soil, apply 100 pounds of sulphur and fifty pounds of air-slaked lime per acre. Sow with seed in drill.

POTATO (IRISH).

Early and late blight.—Both of these are quite common diseases throughout the south and often cause a great deal of damage. The leaves become black and usually a whitish growth of fungus forms on the under surface of the leaves. The late blight is responsible for the wet rots of the potatoes in bins in addition to the blighting of the foliage. When these diseases are frequent the potatoes should be sprayed with Bordeaux mixture every two or three weeks during the growing season and by adding Paris Green, the potato beetle can be combatted by the same application. Air-slaked lime sprinkled among the tubers in bins will check wet rot.

Scab.—This disease is quite generally found wherever the potato is grown in this country, and causes great losses. It appears on the tubers

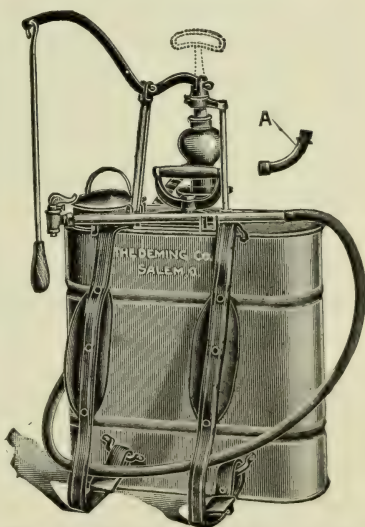


Fig. 16.—Knapsack, Sprayer, for use only in small garden. Too expensive for the work it can do—cost, \$10 to \$12.00. (Deming.)

as rough, dark, scabby spots, which may be so numerous as to cover the whole tuber. The spots usually appear as sunken areas, which is probably due to the attempt of the tuber to withstand attacks. The depth of the scabby spot depends upon the age of the tuber when attacked. If attacked when the tuber is nearly mature the spots are quite superficial. The disease probably lives over in the soil, but is usually carried about on the tubers. Potatoes should not be planted in infected soil and infested or scabby tubers should not be used for seed. As a safeguard, treat the tubers with a solution of formalin. 1 pint of formalin (40% strength) to 30 gallons of water. Soak cut or uncut tubers for two hours in this solution and pour off to dry.

SQUASH.

(See Cucumber.)

SWEET POTATO.

There are several rots of the sweet potato, all affecting the tubers. Diseased roots should not be used for seed and care should be taken not to bruise the tubers when handling. Keep them in a dry place where there is plenty of ventilation, with a temperature of fifty to sixty degrees. Gather and burn diseased potatoes and get plants free from disease.

TOMATO.

Wilt, blight (*Fusarium*).—This disease starts on the plants in the seed bed and spreads to the field. In the field, it begins on the lower leaves and spreads upwards. It produces small dark spots on the leaves and stems and in severe cases destroys the crop. It can be kept in check by spraying three or four times with Bordeaux mixture, beginning soon after transplanting.

Fruit rot or dry rot.—This disease causes the green fruit to rot at the blossom end and causes great damage to tomatoes, both in the field and in the green house. It is doubtful if spraying will be of any value as the disease is supposed to be a constitutional or physiological trouble. Pull up and burn all affected plants and select disease resistant plants.

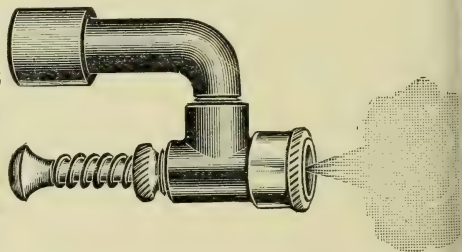


Fig. 17.—Single nozzle of Vermorel type, one of the best nozzles. (E. C. Brown Co.)

WATERMELON.

(See Cucumber.)

DISEASES OF FLOWERS.

The conditions prevailing in greenhouses are favorable to the development of many diseases. Proper attention to heating, watering, and ventilating will reduce these enemies to a minimum and in many cases will keep plants in a healthy condition. Many of the surface fungi can be kept in check by spraying the foliage with clear water or some prepared fungicide. In many cases it is best to destroy infected plants or parts of plants as soon as the disease appears. This prevents the spread of the disease to uninfected plants.

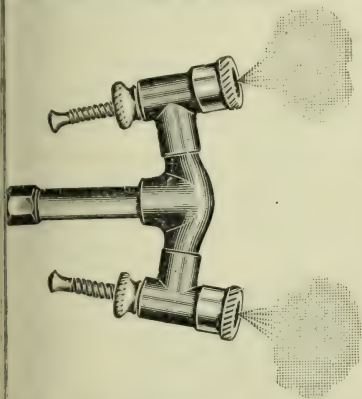


Fig. 18.—Two-point nozzle of Vermorel type, quite commonly used. (E. C. Brown & Co.)

Sulphur is the best fungicide for greenhouse plants and can be used with very little trouble. The simplest method is to make up a paste with a little lime or other powder and water and smear on the heating pipes. When

diseases cannot be kept in check by the above method apply a liquid fungicide, using some of the clear liquids as copper sulphate solution or ammonium copper carbonate to prevent coloring the foliage.

CARNATION.

Carnation Rust.—First noticed as a slight swelling on the stem or leaf and in the early stages the affected parts become almost colorless. As the fungus matures the spores become brownish and impart a brown color to the diseased parts. The rust attacks the carnation in every stage of development from cuttings in the propagating bed to the matured plants. High temperature and a close, damp atmosphere favor the development of the disease.

Take cuttings only from plants free from rust and guard against unfavorable conditions. A strong solution of copper sulphate solution will aid in keeping the rust in check.

Carnation Spot.—This disease is characterized by circular or oblong spots with a brownish center. On the stem the spot appears as an oblong spot on one side. Development is usually due to improper treatment of the plants as over watering, or by allowing the plants to remain

wet over night, especially where the temperature falls quite low. Under favorable conditions, the disease does not become serious. It can be kept in check by the same treatment as recommended for the rust.

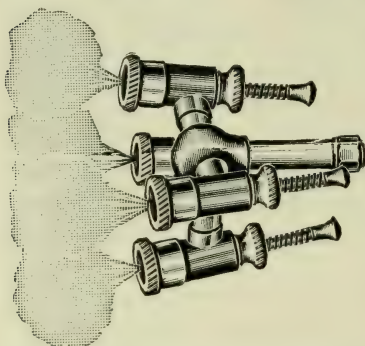


Fig. 19. — Four-point nozzle of Vermorel type. (E. C. Brown Co.)

Stem rot.—In some seasons the disease destroys nearly the whole crop of carnations of some growers. There are three kinds of stem rot of carnations: (1) Where the plant dies at the collar or surface of the ground and the entire plant is lost. (2) "Branch rot," where the branch is affected and only a part of the plant is destroyed. (3) Leaf rot, which seems unable to affect the uninjured leaves but when there are rust spots usually appears.

The spores live over in the soil. As a preventative measure always change the soil after growing a crop of carnations. Sterilize the beds and potting soil and avoid too much nitrogenous matter. Propagate only from strong vigorous plants.

CHRYSANTHEMUM.

Leaf spot.—There are several forms of leaf spot affecting the chrysanthemum. They appear as discolored dead spots on the leaves and are quite noticeable. Pick off and burn all affected leaves and spray with Bordeaux mixture as soon as disease appears and repeat if the disease persists. If it is necessary to spray after the flowers are open use copper sulphate solution or ammonium copper carbonate to prevent coloring the blossoms.

Rust.—Appears very much the same as the carnation rust, as rust or reddish brown spots on the leaves. In propagation use only good healthy plants. Spray just before the appearance of the blossoms with Bordeaux mixture and burn all discolored leaves.

ROSE.

Black spot.—Causes spots on leaves of tea and hybrid roses in wet seasons. The edges of the spots become fringed with white and later in the season turn yellow and fall.

Poorly drained or over-watered beds or a drop in the temperature is likely to cause the appearance of the disease. The disease can be kept in check by using Bordeaux mixture but it gives the foliage a

white-washed appearance, so a solution of copper carbonate is usually used. All affected parts should be removed and burned.

Mildew.—Appears as a mealy or powdery covering on the leaves of the roses and stunts the growth of the young shoots. The leaves are dwarfed and usually turn downward.

Under proper conditions the disease does not do much injury. The general treatment for greenhouse plants will usually be sufficient for the mildew.

Rose rust.—Appears as light yellow spots on both sides of the leaves and upon the stems. The spots are quite small but often run together and cover the leaf, destroying it.

The affected branch should be cut and burned to prevent the spread of the disease. Spraying with Bordeaux or other copper compounds will prevent the spread.

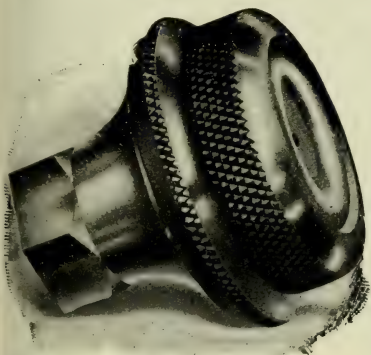


Fig. 20.—Automatic nozzle, one of the larger types of nozzles very satisfactory. Not easily clogged. (E. C. Brown Co.)

Anthrachnose.—This disease affects the tender canes and often girdles the plant, thus cutting off circulation. The disease spreads toward the tips and under favorable conditions spreads very rapidly.

Affected parts should be cut and burned as soon as noticed. Thorough spraying with Bordeaux before the spores germinate is a sure method of preventing the spread. Avoid poorly drained or exhausted soils as these are conditions favorable to the development of the anthrachnose.

VIOLET.

Spot disease.—This is the most serious disease of the violet and is often referred to as the “violet disease.” It is found wherever the violet is grown and the first faint indication of its presence is a very faint odor noticed by the expert violet grower. It forms greenish water spots on the leaves and in these spots spores are formed.

Every spot should be removed and burned and if the leaf has several spots it is best to remove and burn the whole leaf. As yet no fungicide has been found that will be of much value in keeping the disease in check. Keep the house clean and have the very best conditions for growth,—never allowing water to remain on the leaves

very many hours. Over-feeding and fumigation with tobacco smoke weakens the plant, thus making it more susceptible to the spot.

Wilt or stem rot.—This disease is next to spot in importance. It is usually confined to the stems but sometimes affects the leaf. The first indications of the disease is a wilting during the day and reviving at night. On examination the plant will usually be found to be girdled by the fungus and the circulation thus cut off.

Pulling off the leaves gives a good chance for the spores to enter and the method of propagation by dividing the crown carries the disease over from year to year. Continuous use of the same soil also aids in the propagation of the disease.

Manufacturers and dealers in spraying machinery and appliances.—E. C. Brown & Co., Rochester, N. Y.; The Deming Co., Salem, Ohio; The Goulds Mfg. Co., Seneca Falls, N. Y.; Spramotor Co., Buffalo, N. Y.; Friend Mfg. Co., Gasport, N. Y.; Cushman Power Sprayer, Lincoln, Neb.; Olds Gas Power Co., Lansing, Mich.; W. & B. Douglas, Middleton, Conn.; Hardie Mfg. Co., Hudson, Mich.; Deyo & Co., Binghampton, N. Y.; Wm. Stahl Sprayer Co., Quincey, Ill.; F. E. Meyers & Bro., Ashland, Ohio; Moril and Morley, Benton Harbor, Mich.; Field Force Pump Co., Elmira, N. Y.

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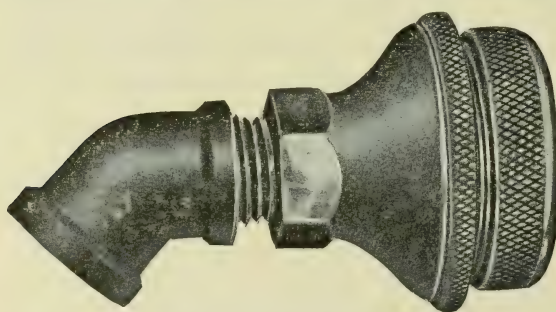


Fig. 21.—Nozzle with 45 degree attachment to extension rod. With this attachment the spray can be directed downward into the tree. A useful device. (E. C. Brown Co.)

The cuts illustrating spray nozzles and appliances were loaned by E. C. Brown Co., of Rochester, N. Y., the power sprayer is from a photograph by Friend Mfg. Co. All of the cuts showing disease injury to fruit are from plates loaned by the Virginia Experiment Station; the cut of bean anthracnose was loaned by the West Virginia Experiment Station. The author wishes to express his appreciation of the courtesy shown by the gentlemen who were responsible for loaning these illustrations.

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Crown gall	11
Plum pockets	11
POTATO DISEASES (Irish)—	
Blight	22
Scab	22
ROSE DISEASES—	
Anthracnose	22
Black spot	22
Mildew	22
Rust	22
SQUASH DISEASES—(See under Cucumber)	
SWEET POTATO DISEASES.....	22
STRAWBERRY DISEASES—	
Leaf spot	11
TOMATO DISEASES—	
Fruit rot or dry rot	22
Wilt or blight (fusarium)	22
VIOLET DISEASES—	
Spot disease	22
Stem rot or wilt	30
WATERMELON DISEASES—(See under Cucumber)	

Mississippi Agricultural Experiment Station
Agricultural College, Mississippi

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BULLETIN No. 142.  
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INSPECTION AND ANALYSES
OF COMMERCIAL FERTILIZER

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

NOVEMBER, 1910.



# MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.

## *INSPECTION AND ANALYSES OF FERTILIZERS.*

|                       |                   |
|-----------------------|-------------------|
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# THE INSPECTION AND ANALYSES OF COMMERCIAL FERTILIZERS.

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**Introduction.**—The general results of the inspection of fertilizers and fertilizer materials for the season of 1909-1910 are presented and discussed in this bulletin. Analyses of 199 samples drawn by inspectors were published in February and March in Circulars Nos. 30 and 31. During those months in which the trade in fertilizers is most active, analyses are made and published as promptly as possible with the view of supplying buyers and sellers with information concerning the composition distributed under the more important brand names.

Deficiencies established by careful sampling and analysis are always brought to the attention of the purchaser. The distribution of fertilizers in this state is very rapid, the bulk of the business being done in about ninety days; shipments often remain in the possession of merchants only a few days, and it not infrequently happens, therefore, that consignments found materially deficient by analysis cannot be reached and attached in accordance with the provisions of the statute.

**Purchasing on basis of analysis or guarantee.**—Since fertilizers made from materials of the same general character and availability are supplied by many manufacturers, a guarantee or a chemical analysis showing the amounts of the various forms of plant food present must be used as a basis in buying. Farmers and merchants should avail themselves of the information in this bulletin before making contracts for the coming year. Having decided upon the character of the fertilizer, the purchaser should then endeavor to secure as much plant food as possible for the money spent. These fertilizer bulletins will supply the information which will enable him to most surely do this.

**Low grade fertilizers.**—The purchase of the so-called cheap or low grade fertilizers is certainly never advisable. The cheapness of these mixtures is only apparent. It is not the price per ton of the fertilizer, but the price per pound of the plant food in it which should be subjected to inquiry by the merchant or farmer who is ready to buy.

A low grade fertilizer can be sold by the retailer at a low price per ton, but no saving is effected when the price per pound of its valuable ingredients is considered.

A merchant with the best interests of his customers in mind should not handle cheap mixtures. If he makes a greater profit from them, it is paid by those unacquainted with the proper valuation of fertilizers.

Competition in **price alone**, instead of the more rational competition in **quality and in price** has resulted in many mistakes without doubt in the fertilizer trade. Manufacturers, intelligent merchants, and progressive farmers should lose no opportunity of protecting the general trade from the irrational and unfair competition wherein the price of a ton is the deciding factor in a transaction.

No "Off Grade" fertilizer or cotton-seed meal should be allowed sold in this state. Dealers should not handle them because they happen to admit a more attractive margin of profit, and manufacturers should not make them, because they know that farmers should not be encouraged to buy them.

**Illustrations of the relative values of "standard grade" and "high grade" fertilizers.**—A fertilizer classified under our law as standard grade and two mixtures entitled to classification as high grade may be made by a manufacturer by mixing the raw materials given below in the proportions shown:

|                                                                      | Mixture<br>No. 1. | Mixture<br>No. 2. | Mixture<br>No. 3. |
|----------------------------------------------------------------------|-------------------|-------------------|-------------------|
| 14% Acid Phosphate, lbs. per ton of complete Fertilizer .....        | 1200              |                   |                   |
| 16.50% Acid. Phos., lbs. per ton of complete Fertilizer .....        |                   | 1310              |                   |
| 18.00% Acid Phos., lbs. per ton of complete Fertilizer .....         |                   |                   | 1500              |
| 6.30% C-S. Meal, lbs. per ton of complete Fert. ....                 | 525               |                   |                   |
| 13.00% Dried Blood, lbs. per ton of complete Fertilizer .....        |                   | 145               | 200               |
| 15.00% Nitrate of Soda, lbs. per ton of complete Fertilizer .....    |                   | 145               | 180               |
| 12.50% Kainit, lbs. per ton of complete Fert. ....                   | 275               | 400               |                   |
| 50.00% Sulphate of Potash, lbs. per ton of complete Fertilizer ..... |                   |                   | 120               |
| Total, lbs. ....                                                     | 2000              | 2000              | 2000              |

The analyses and relative values of the above mixtures are shown by the following statement:

|                                       | Mixture<br>No. 1. | Mixture<br>No. 2. | Mixture<br>No. 3. |
|---------------------------------------|-------------------|-------------------|-------------------|
| Water-soluble Phos. Acid .....        | 6.00%             | 7.50%             | 10.00%            |
| Citrate-soluble (reverted) Phos. Acid | 3.00%             | 3.30%             | 3.50%             |
| Nitrogen .....                        | 1.65%             | 2.00 %            | 2.50%             |
| Potash .....                          | 2.00%             | 2.50%             | 3.00%             |
| Total Percentage of plant food ....   | 12.65%            | 15.30%            | 19.00 %           |

|                                           |           |           |           |
|-------------------------------------------|-----------|-----------|-----------|
| Total amount plant food in a ton .....    | 253 lbs.  | 306 lbs.  | 380 lbs.  |
| Material of no especial value in a ton .. | 1747 lbs. | 1694 lbs. | 1620 lbs. |
| Relative commercial value per ton .....   | \$19.81   | \$24.01   | \$29.92   |

It is plain that the highest grade mixture, No. 3 is as cheap at \$29.92 per ton as the lowest, No. 1, is at \$19.81 per ton. These fertilizers are of the same general character. No. 3 contains 380 pounds of plant food, while No. 1 carries only 253 pounds.

These illustrations should make it plain that the farmer must ascertain the proportions and amounts of the forms of plant food in any fertilizer before he can determine whether his dealer demands a fair price for it.



# GENERAL RESULTS OF THE INSPECTION

SEASON 1909-1910.



**Number of analyses.**—This bulletin contains analyses of 665 samples drawn by inspectors. The results of the analyses of the so-called official (manufacturers') samples are not published this season an account of the lack of funds.

The classification given below shows the general distribution of analytical work during the last three seasons:

| SAMPLES OF                           | Season of<br>1907-1908. | Season of<br>1908-1909. | Season of<br>1909-1910. |
|--------------------------------------|-------------------------|-------------------------|-------------------------|
| Complete fertilizer .....            | 345                     | 358                     | 435                     |
| Acid phosphate.....                  | 148                     | 174                     | 183                     |
| Acid phosphate with potash.....      | 4                       |                         | 8                       |
| Acid phosphate with nitrogen .....   |                         | 2                       | 10                      |
| Ground bone .....                    | 3                       | 4                       | 2                       |
| Potash salts.....                    | 24                      | 26                      | 20                      |
| Miscellaneous samples .....          | 2                       | 5                       | 7                       |
| Total Inspectors' samples .....      | 526                     | 569                     | 665                     |
| Official (manufacturers') samples .. | 294                     | 311                     | 402                     |
| Total number of samples .....        | 820                     | 880                     | 1067                    |

**Distribution of Analytical work.**—A comparatively large number of samples of the more popular brands representing a large percentage of the total sales were analyzed. It is fortunate that the number of brands of fertilizer on sale in this state is small. This renders the inspection simpler and more efficient. There is certainly no pressing

necessity of multiplying brand names to the extent noted in some states, and the distribution of the greater proportion of the analytical work among a comparatively small number of brands should be more satisfactory to the public than if the work were necessarily extended over hundreds of brands, as is often the case elsewhere.

Dealers or farmers who desire prompt analyses of samples drawn from goods in their possession can always obtain them by making a request for the results. The Department desires to co-operate in every helpful way with those interested in the fertilizer trade.

**General review of the results.**—The especial attention of buyers is invited to tables Nos. I and II on pages 12 and 14. These tables present in a condensed form a general analysis of the results of the inspection.

The following comparative statement shows the trend of the results during the last few years and it also indicates that some manufacturers at least are allowing margins that are not sufficient to protect their brands from inevitable variations in raw materials and in manufacture.

#### Comparative Statement.

| SEASON OF       | Number of<br>Tons sold in<br>State. | Number of In-<br>spectors' Sam-<br>ples Analyzed. | Number of<br>Samples below<br>Guarantee in<br>Relative Value | Percentage be-<br>low Guarantee<br>in Relative Val. | Percentage as<br>much or more<br>than 3% below<br>in Relative Val. |
|-----------------|-------------------------------------|---------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------|
| 1902-1903 ..... | 81,892.25                           | 262                                               | 28                                                           | 10.68                                               |                                                                    |
| 1903-1904 ..... | 137,942.45                          | 280                                               | 42                                                           | 15.00                                               |                                                                    |
| 1904-1905 ..... | 114,260.45                          | 399                                               | 35                                                           | 8.77                                                |                                                                    |
| 1905-1906 ..... | 138,467.95                          | 437                                               | 33                                                           | 7.55                                                | 3.43                                                               |
| 1906-1907 ..... | 138,669.75                          | 506                                               | 64                                                           | 12.64                                               | 5.73                                                               |
| 1907-1908 ..... | 143,191.90                          | 526                                               | 117                                                          | 22.24                                               | 9.88                                                               |
| 1908-1909 ..... | 139,884.10                          | 569                                               | 141                                                          | 24.60                                               | 12.13                                                              |
| 1909-1910 ..... | 132,776.70                          | 665                                               | 164                                                          | 24.66                                               | 13.83                                                              |

The following is interesting from the standpoint of a general review of the results for the past two years:

|                                                                     | Season of<br>1908-1909. | Season of<br>1909-1910. |
|---------------------------------------------------------------------|-------------------------|-------------------------|
| Number of samples analyzed .....                                    | 569                     | 665                     |
| Percentage equal or above guaranty in everything .....              | 44.46                   | 41.65                   |
| Percentage <b>equal or above</b> guaranty in relative value .....   | 75.40                   | 75.34                   |
| Percentage 4% or more above guaranty in relative value .....        | 48.86                   | 55.49                   |
| Percentage 6% or more above guaranty in relative value .....        | 34.97                   | 43.61                   |
| Percentage 10% or more above guaranty in relative value .....       | 15.64                   | 26.47                   |
| Percentage <b>4% or more below</b> guaranty in relative value ..... | 10.02                   | 12.03                   |
| Percentage 6% or more below guaranty in relative value .....        | 4.92                    | 6.62                    |
| Percentage 10% or more below guaranty in relative value .....       | 1.93                    | 3.01                    |

The above statement is sufficient to further emphasize the necessity already pointed out of allowing greater margins over guaranties in the manufacture of fertilizers sold in this state. As long as this is not the case, unsatisfactory results will be shown by this system of inspection. A **price** instead of a **quality** competition is responsible in large measure doubtless for this state of the trade.

It is only fair, however, in this connection to point out the decided improvement this season in the percentage of samples as much or more than 10% **above** guarantee in relative value, the foregoing tabular statement showing 15.64% for 1908-1909 and 26.47 for 1909-1910.

The marked deficiencies in value are confined to the goods sold by a comparatively small number of companies, and while 3.01% of all samples analyzed are 10% or more below guarantee in value, 26.47% are 10% or more above, as pointed out in the foregoing paragraph. Table III on page 16 should be considered in this connection, since the average of all samples analyzed and average of corresponding guaranties are given therein.

**Deficiencies in Nitrogen.**—Especial attention was directed to deficiencies in nitrogen in Bulletin No. 126, for season of 1908-1909.

The results for this season show some improvement, but the condition of the trade with respect to this element cannot be considered satisfactory when 25.11% of all samples containing nitrogen exhibit a deficiency of 8% or more in this element.

The following statement is sufficient to again illustrate the necessity on the part of some manufacturers of allowing a safer margin for variations in nitrogen. Some of the deficiencies are very marked, but the general average is brought up (in standard grade goods) by excess in many samples, as will be observed in table V.

|                                                                          | Season of<br>1908-1909. | Season of<br>1909-1910. |
|--------------------------------------------------------------------------|-------------------------|-------------------------|
| Average of guaranties on nitrogen in standard<br>grade fertilizers ..... | 1.66%                   | 1.66%                   |
| <b>Average nitrogen found in standard grade<br/>fertilizers .....</b>    | <b>1.61%</b>            | <b>1.66%</b>            |
| Average of guaranties on nitrogen in high grade<br>fertilizers .....     | 1.65%                   | 1.95%                   |
| <b>Average nitrogen found in high grade fertilizers</b>                  | <b>1.37%</b>            | <b>1.79%</b>            |

It is true that the excess in phosphoric acid in very many cases prevents too great a depression in relative commercial value when nitrogen determinations are low, but a compensation of this kind is allowable to only a limited extent. The essential character of a fertilizer ought not to be modified even though the final results give a value equal to the guaranty.

Farmers should support manufacturers who maintain their guaranties without regard to competitive conditions; they may have to charge a little more than those who sell goods slightly under or barely equal to guaranties, but the fertilizers are worth more to the purchasers.

Let it be said that Mississippi brands always redeem the claims made for them at the cost even of somewhat advanced prices if necessary. Let dealers, as well as farmers give greater consideration to the amounts and value of the several forms of plant food contained in a ton, and pay less attention to the price of a ton until this information has been secured. Let manufacturers see that all goods are properly compounded, and this system of inspection will place within the reach of all interested in this trade accurate data concerning the composition of fertilizers sold in the state.

**General averages.**—Table III on page 16 has been prepared for the purpose of giving a general view of the guaranties filed for the



several classes of fertilizers, and the average composition of the goods sold them. Attention should be directed to the fact that the averages shown for inspectors' samples are not averages in a strict sense, since these results were obtained by making averages from the average analyses in table V. This procedure, however, does not involve a serious loss of accuracy in these cases, and the table is interesting especially when considered in connection with tables I and II immediately preceding it.

**Average of guaranties.**—Only those guaranties which are represented by analyses in this bulletin are given in table III. Table IV shows the average of all guaranties filed for season 1908-1909 on the several classes of fertilizers sold. Representative samples of all brands registered could not be obtained. Probably very few shipments of some of them were ever made.

**Reports of analyses.**—When analyses are completed they are reported to the manufacturers and those from whom samples were obtained. The especial attention of the owner and maker is directed to deficiencies brought to light by the chemical analyses, and every effort is made to see that the farmer, who is the principal sufferer in such cases, receives the protection which was contemplated when the system of inspection was inaugurated.

Most manufacturers are willing enough to protect their customers from loss due to unavoidable errors in manufacture and in most cases this also is done without discussion as to whether deficiencies are "material" within the meaning of section 2257 of the fertilizer law.

Some manufacturers, however, are somewhat disposed to view deficiencies reported in their goods as due to improper sampling or analysis. The facts, law, and circumstances are placed before the purchaser when nothing irregular is discovered in the history of those samples found below guarantee.

**Shipments attached.**—Several shipments were attached during the season. These are indicated in the foot-notes in table V. In some cases attachments could not be served owing to the rapid distribution.

| Schedule of values:                                                   | per lb.            | per unit. |
|-----------------------------------------------------------------------|--------------------|-----------|
| For Nitrogen.....                                                     | 21 $\frac{1}{4}$ c | \$4.25    |
| For Water Soluble Phosphoric Acid in mixed goods                      | 6c                 | 1.20      |
| For Citrate-Soluble Phosphoric Acid in mixed goods                    | 5 $\frac{1}{2}$ c  | 1.10      |
| For Water-Soluble Phosphoric Acid in plain Acid<br>Phosphates .....   | 5 $\frac{1}{2}$ c  | 1.10      |
| For Citrate-Soluble Phosphoric Acid in plain Acid<br>Phosphates ..... | 5c                 | 1.00      |
| For total Phosphoric Acid in fine bone .....                          | 3c                 | .60       |
| For total Phosphoric Acid in med. and coarse bone ..                  | 2 $\frac{1}{2}$ c  | .50       |
| For Potash .....                                                      | 5c                 | 1.00      |

The above figures possess a comparative significance only, but they are intended to approximate the relative market values of the valuable constituents of fertilizers; actual retail prices are controlled, of course, entirely by conditions of the market from time to time.



|                                                        |     |       |      |       |       |       |       |
|--------------------------------------------------------|-----|-------|------|-------|-------|-------|-------|
| MERIDIAN FERTILIZER FACTORY, Meridian, Miss.           | 77  | 37    | 0    | 6     | 10    | 2     | 71    |
| MISSISSIPPI FERTILIZER COMPANY, Jackson, Miss.         | 8   | 2     | 0    | 3     | 3     | 0     | 5     |
| Mt. PLEASANT FERTILIZER COMPANY, Mt. Pleasant, Tenn.   | 3   | 2     | 0    | 0     | 0     | 0     | 2     |
| NATIONAL FERTILIZER COMPANY, Nashville, Tenn.          | 14  | 2     | 1    | 6     | 6     | 3     | 9     |
| NEW ORLEANS ACID & FERTILIZER Co., New Orleans, La.    | 36  | 14    | 2    | 5     | 7     | 6     | 25    |
| NEWTON OIL & M'F'G. COMPANY, Newton, Miss.             | 21  | 6     | 6    | 3     | 2     | 8     | 11    |
| NITRATE AGENCIES COMPANY, New Orleans, La.             | 3   | 3     | 0    | 0     | 0     | 0     | 3     |
| PIONEER FERTILIZER COMPANY, Florence, Ala.             | 29  | 6     | 3    | 14    | 6     | 7     | 21    |
| PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La.   | 11  | 3     | 0    | 3     | 0     | 1     | 6     |
| PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.          | 16  | 2     | 6    | 2     | 0     | 6     | 7     |
| READ PHOSPHATE COMPANY, Nashville, Tenn.               | 5   | 2     | 1    | 0     | 0     | 0     | 4     |
| REFUGE COTTON OIL COMPANY, Columbus, Miss.             | 10  | 2     | 0    | 4     | 3     | 5     | 3     |
| F. S. ROYSTERS GUANO COMPANY, Norfolk, Va.             | 2   | 0     | 0    | 1     | 1     | 0     | 2     |
| SHUBUTA OIL & M'F'G. COMPANY, Shubuta, Miss.           | 3   | 3     | 0    | 0     | 0     | 0     | 3     |
| SOUTHERN COTTON OIL COMPANY, Memphis, Tenn.            | 1   | 0     | 0    | 0     | 1     | 0     | 1     |
| SOUTHERN OIL & FERTILIZER Co., Meridian, Miss.         | 20  | 6     | 0    | 4     | 2     | 1     | 16    |
| STANDARD GUANO & CHEMICAL M'F'G. Co., New Orleans, La. | 24  | 18    | 1    | 1     | 0     | 1     | 23    |
| SWIFT FERTILIZER WORKS, Atlanta, Ga.                   | 3   | 0     | 0    | 2     | 1     | 3     | 0     |
| TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.           | 4   | 0     | 1    | 1     | 1     | 1     | 1     |
| TENNESSEE VALLEY FERTILIZER COMPANY, Florence, Ala.    | 10  | 4     | 0    | 4     | 0     | 1     | 7     |
| THREEFOOT BROS. & COMPANY, Meridian, Miss.             | 9   | 6     | 2    | 1     | 1     | 2     | 7     |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss.               | 14  | 7     | 0    | 3     | 1     | 0     | 13    |
| VIRGINIA-CAROLINA CHEMICAL Co., Memphis, Tenn.         | 55  | 16    | 9    | 5     | 5     | 14    | 34    |
| WESSON COTTON OIL & FERTILIZER Co., Wesson             | 1   | 0     | 0    | 0     | 0     | 0     | 1     |
| TOTALS                                                 | 665 | 277   | 54   | 114   | 73    | 92    | 501   |
| Percentage                                             |     | 41.65 | 8.49 | 25.11 | 15.66 | 13.83 | 75.34 |
| Totals for Season 1908-1909                            | 569 | 253   | 27   | 112   | 89    | 69    | 429   |
| Percentage for Season 1908-1909                        |     | 44.46 | 4.98 | 30.35 | 22.94 | 12.13 | 75.40 |
| Totals for Season 1907-1908                            | 526 | 275   | 37   | 57    | 32    | 52    | 409   |
| Percentage for Season 1907-1908                        |     | 52.28 | 7.37 | 16.28 | 8.53  | 9.88  | 77.76 |
| Totals for Season 1906-1907                            | 506 | 285   | 27   | 47    | 47    | 29    | 442   |
| Percentage for Season 1906-1907                        |     | 56.32 | 5.33 | 13.35 | 12.43 | 5.73  | 87.35 |
| Totals for Season 1905-1906                            | 437 | 246   | 16   | 66    | 15    | 15    | 404   |
| Percentage for Season 1905-1906                        |     | 56.29 | 3.78 | 19.64 | 4.36  | 3.43  | 92.45 |



TABLE II.—A Further Summary of Results in Table V.

| NAME AND ADDRESS OF MANUFACTURER.                                  | Number of Samples Analyzed. | Number equal to or above guarantee in Available Phosphoric Acid Nitrogen and Potash. | Number equal or above guarantee in Relative Value. | Number as much as four per cent above guarantee in Relative Value. | Number as much as six per cent above guarantee in Relative Value. | Number ten per cent or more above guarantee in Relative Value. | Number as much as four per cent below guarantee in Relative Value. | Number as much as six per cent below guarantee in Relative Value. | Number ten per cent or more below guarantee in Relative Value. |
|--------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                    |                             |                                                                                      |                                                    |                                                                    |                                                                   |                                                                |                                                                    |                                                                   |                                                                |
| ALABAMA CHEMICAL COMPANY, Montgomery, Ala.                         | 2                           | 1                                                                                    | 2                                                  | 2                                                                  | 1                                                                 | 0                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| AMERICAN GUANO COMPANY, Nashville, Tenn.                           | 6                           | 1                                                                                    | 3                                                  | 3                                                                  | 1                                                                 | 0                                                              | 0                                                                  | 0                                                                 | 1                                                              |
| BIRMINGHAM FERTILIZER COMPANY, Birmingham, Ala.                    | 9                           | 2                                                                                    | 5                                                  | 3                                                                  | 1                                                                 | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| BROOKHAVEN COTTON OIL & FERT CO., Brookhaven, Miss.                | 10                          | 4                                                                                    | 9                                                  | 6                                                                  | 3                                                                 | 2                                                              | 1                                                                  | 0                                                                 | 0                                                              |
| CADDO FERTILIZER COMPANY, Shreveport, La.                          | 1                           | 0                                                                                    | 1                                                  | 1                                                                  | 1                                                                 | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| CANTON OIL MILL COMPANY, Canton, Miss.                             | 11                          | 4                                                                                    | 7                                                  | 3                                                                  | 0                                                                 | 0                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| CAPITAL FERTILIZER & M'F'G. CO., Jackson, Miss.                    | 38                          | 18                                                                                   | 31                                                 | 19                                                                 | 15                                                                | 6                                                              | 3                                                                  | 3                                                                 | 0                                                              |
| CRYSTAL SPRINGS OIL MILL. FERT. & M'F'G. CO., Crystal Sp'gs, Miss. | 8                           | 4                                                                                    | 8                                                  | 7                                                                  | 7                                                                 | 7                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| EAGLE COTTON OIL COMPANY, Meridian, Miss.                          | 9                           | 4                                                                                    | 8                                                  | 6                                                                  | 4                                                                 | 1                                                              | 1                                                                  | 0                                                                 | 0                                                              |
| FEDERAL CHEMICAL COMPANY, Louisville, Ky.                          | 2                           | 2                                                                                    | 2                                                  | 2                                                                  | 2                                                                 | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| FLORENCE COTTON OIL COMPANY, Florence, Ala.                        | 14                          | 1                                                                                    | 6                                                  | 2                                                                  | 2                                                                 | 2                                                              | 4                                                                  | 3                                                                 | 3                                                              |
| A. H. GEORGE & COMPANY, Meridian, Miss.                            | 9                           | 3                                                                                    | 5                                                  | 4                                                                  | 1                                                                 | 1                                                              | 2                                                                  | 2                                                                 | 1                                                              |
| GREAT SOUTHERN PHOSPHATE CO., Mt. Pleasant, Tenn.                  | 28                          | 15                                                                                   | 23                                                 | 22                                                                 | 12                                                                | 6                                                              | 3                                                                  | 3                                                                 | 0                                                              |
| GULFPORT COTTON OIL, FERT & M'F'G. CO., Gulfport, Miss.            | 22                          | 6                                                                                    | 11                                                 | 8                                                                  | 3                                                                 | 3                                                              | 7                                                                  | 3                                                                 | 1                                                              |
| HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss.                 | 12                          | 8                                                                                    | 12                                                 | 12                                                                 | 11                                                                | 8                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| JACKSON FERTILIZER COMPANY, Jackson, Miss.                         | 71                          | 41                                                                                   | 59                                                 | 46                                                                 | 34                                                                | 13                                                             | 3                                                                  | 3                                                                 | 2                                                              |
| JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.                     | 4                           | 1                                                                                    | 4                                                  | 0                                                                  | 0                                                                 | 0                                                              | 0                                                                  | 0                                                                 | 0                                                              |

|                                                    |     |       |       |       |       |       |       |      |      |
|----------------------------------------------------|-----|-------|-------|-------|-------|-------|-------|------|------|
| LAUREL OIL & FERTILIZER Co., Laurel, Miss.         | 27  | 19    | 27    | 23    | 22    | 15    | 0     | 0    | 0    |
| LOTTERHOS & HUBER Co., Crystal Springs, Miss.      | 2   | 2     | 2     | 2     | 2     | 1     | 0     | 0    | 0    |
| MARBACH & EAGAN, Crystal Springs, Miss.            | 1   | 0     | 1     | 0     | 0     | 0     | 0     | 0    | 0    |
| MERIDIAN FERTILIZER FACTORY, Meridian, Miss.       | 77  | 37    | 71    | 57    | 53    | 36    | 2     | 0    | 0    |
| MISSISSIPPI FERTILIZER Co., Jackson, Miss.         | 8   | 2     | 5     | 3     | 3     | 1     | 0     | 0    | 0    |
| Mt. Pleasant Fertilizer Co., Mt. Pleasant, Tenn.   | 3   | 2     | 2     | 2     | 1     | 1     | 0     | 0    | 0    |
| NATIONAL FERTILIZER COMPANY, Nashville, Tenn.      | 14  | 2     | 9     | 4     | 4     | 2     | 3     | 3    | 2    |
| NEW ORLEANS ACID & FERT. Co., New Orleans, La.     | 36  | 14    | 25    | 15    | 14    | 8     | 2     | 1    | 0    |
| NEWTON OIL & M'F'g. Co., Newton, Miss.             | 21  | 6     | 11    | 8     | 5     | 2     | 8     | 3    | 0    |
| NITRATE AGENCIES Co., New Orleans, La.             | 3   | 3     | 3     | 1     | 0     | 0     | 0     | 0    | 0    |
| PIONEER FERTILIZER COMPANY, Florence, Ala.         | 29  | 6     | 21    | 19    | 15    | 9     | 7     | 2    | 1    |
| PLANTERS FERT. & CHEMICAL Co., New Orleans, La.    | 11  | 3     | 6     | 2     | 2     | 1     | 1     | 0    | 0    |
| PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.      | 16  | 2     | 7     | 3     | 2     | 0     | 6     | 5    | 2    |
| READ PHOSPHATE COMPANY, Nashville, Tenn.           | 5   | 2     | 4     | 0     | 0     | 0     | 0     | 0    | 0    |
| REFUGUE COTTON OIL COMPANY, Columbus, Miss.        | 10  | 2     | 3     | 0     | 0     | 0     | 5     | 2    | 0    |
| F. S. ROYSTER GUANO COMPANY, Norfolk, Va.          | 2   | 0     | 2     | 0     | 0     | 0     | 0     | 0    | 0    |
| SHUBUTA OIL M'F'g. Co., Shubuta, Miss.             | 3   | 3     | 3     | 3     | 3     | 3     | 0     | 0    | 0    |
| SOUTHERN COTTON OIL COMPANY, Memphis, Tenn.        | 1   | 0     | 1     | 0     | 0     | 0     | 0     | 0    | 0    |
| SOUTHERN OIL & FERTILIZER COMPANY, Meridian, Miss. | 20  | 6     | 16    | 13    | 11    | 6     | 1     | 0    | 0    |
| STANDARD GUANO & CHEMICAL Co., New Orleans, La.    | 24  | 18    | 23    | 21    | 20    | 18    | 1     | 1    | 1    |
| SWIFT FERTILIZER WORKS, Atlanta, Ga.               | 3   | 0     | 0     | 0     | 0     | 0     | 2     | 0    | 0    |
| TENNESSEE CHEMICAL COMPANY, Nashville, Tenn.       | 4   | 0     | 1     | 0     | 0     | 0     | 1     | 1    | 1    |
| TENNESSEE VALLEY FERT. Co., Florence, Ala.         | 10  | 4     | 7     | 6     | 6     | 4     | 1     | 0    | 0    |
| THREFOOT BROS. & COMPANY, Meridian, Miss.          | 9   | 6     | 7     | 6     | 4     | 2     | 2     | 1    | 0    |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss.           | 14  | 7     | 13    | 12    | 10    | 7     | 0     | 0    | 0    |
| VIRGINIA-CAROLINA CHEMICAL Co., Memphis, Tenn.     | 55  | 16    | 34    | 23    | 14    | 7     | 12    | 8    | 5    |
| WESSON COTTON OIL & FERTILIZER Co., Wesson, Miss.  | 1   | 0     | 1     | 1     | 1     | 1     | 0     | 0    | 0    |
| Total                                              | 665 | 277   | 501   | 369   | 290   | 176   | 80    | 44   | 20   |
| Percentage                                         |     | 41.65 | 75.34 | 55.49 | 43.61 | 26.47 | 12.03 | 6.62 | 3.01 |
| Totals for Season 1908-1909                        | 569 | 253   | 429   | 278   | 199   | 89    | 57    | 28   | 11   |
| Percentage for Season 1908-1909                    |     | 44.46 | 75.40 | 48.86 | 34.97 | 15.64 | 10.02 | 4.92 | 1.93 |

TABLE III.—Averages of Guaranties Compared with Average Composition of the Fertilizers Sold Under Them—Season 1909-1910.

|                                                               | Number of Guaranties. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Commercial Value Per Ton. |
|---------------------------------------------------------------|-----------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|------------------------------------|
|                                                               |                       |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                                    |
| Average of guaranties on H. G. Acid Phosphate 16%             | 27                    |                    | 12.74                   | 3.26                      | 16.00               | 1.41                |                    |                  | 17.27                              |
| Average of analyses of inspectors' samples                    |                       | 11.65              | 12.35                   | 3.39                      | 15.74               | .86                 |                    |                  | 16.97                              |
| Average of guaranties on H. G. Acid Phosphates other than 16% | 24                    |                    | 10.83                   | 3.17                      | 14.00               | 1.54                |                    |                  | 15.08                              |
| Average of analyses of inspectors' samples                    |                       | 13.81              | 10.89                   | 3.62                      | 14.51               | .92                 |                    |                  | 15.59                              |
| Average of guaranties on S. G. Acid Phosphates                | 4                     |                    | 9.25                    | 2.75                      | 12.00               | 1.75                |                    |                  | 12.92                              |
| Average of analyses of inspectors' samples                    |                       | 10.78              | 9.32                    | 3.61                      | 12.96               | .61                 |                    |                  | 13.89                              |
| Average of guaranties on S. G. Complete Fertilizers           | 81                    |                    | 6.86                    | 2.49                      | 9.35                | 1.61                | 1.66               | 1.59             | 19.61                              |
| Average of analyses of inspectors' samples                    |                       | 11.88              | 7.25                    | 3.11                      | 10.36               | 1.27                | 1.66               | 1.73             | 20.90                              |
| Average of guaranties on H. G. Complete Fertilizers           | 20                    |                    | 7.65                    | 2.62                      | 10.27               | 1.80                | 1.95               | 1.64             | 21.98                              |
| Average of analyses of inspectors' samples                    |                       | 12.99              | 8.06                    | 3.07                      | 11.13               | 1.19                | 1.79               | 1.70             | 22.36                              |
| Average of guaranties on H. G. "Vegetable" Fertilizers        | 10                    |                    | 4.95                    | 2.30                      | 7.25                | 1.55                | 2.86               | 3.65             | 24.28                              |
| Average of analyses of inspectors' samples                    |                       | 9.88               | 5.52                    | 2.88                      | 8.40                | 1.38                | 2.87               | 3.93             | 25.91                              |

TABLE IV.—Average of Guaranties Season 1909-1910.

|                                                                 | Number of Guaranties Averaged. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative (Commercial Value Per Ton. |
|-----------------------------------------------------------------|--------------------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------------------|
|                                                                 |                                | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                                     |
| Average of guaranties on H. G. Acid Phosphate 16%               | 34                             | 12.68                   | 3.32                      | 16.00               | 1.62                |                    |                  | 17.27                               |
| Average of guaranties on H. G. Acid Phosphate other than 16%    | 45                             | 11.07                   | 2.95                      | 14.02               | 1.54                |                    |                  | 15.13                               |
| Average of guaranties on S. G. Acid Phosphate                   | 18                             | 9.22                    | 2.78                      | 12.00               | 1.64                |                    |                  | 12.92                               |
| Average of guaranties on H. G. Mixed Fertilizers                | 34                             | 7.37                    | 2.58                      | 9.95                | 1.59                | 1.82               | 1.81             | 21.23                               |
| Average of guaranties on H. G. "Vegetable" Fertilizers          | 35                             | 5.55                    | 2.09                      | 7.64                | 1.54                | 2.93               | 4.09             | 25.50                               |
| Average of guaranties on Phosphoric Acid and Potash Compounds   | 19                             | 7.92                    | 2.63                      | 10.55               | 1.97                |                    | 2.39             | 14.79                               |
| Average of guaranties on S. G. Mixed Fertilizers                | 112                            | 6.91                    | 2.37                      | 9.28                | 1.62                | 1.66               | 1.57             | 19.56                               |
| Average of guaranties on Phosphoric Acid and Nitrogen Compounds | 13                             | 7.96                    | 2.45                      | 10.41               | 1.62                | 1.92               |                  | 20.41                               |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                             | Where and from Whom Collected.      |
|--------------------|-----------------------------------------------------------------------------|-------------------------------------|
|                    | <b>ALABAMA CHEMICAL COMPANY,</b><br>Montgomery, Ala.,                       |                                     |
| 14583              | S.G. Liberty Bell Blood and Bone                                            | Smith & Epting, Guntown.....        |
|                    |                                                                             | Guarantee.....                      |
| 14584              | S. G. German Kainit .....                                                   | Smith & Epting, Guntown.....        |
|                    |                                                                             | Guarantee.....                      |
|                    | <b>AMERICAN GUANO COMPANY</b><br>Nashville, Tenn.                           |                                     |
| 13361              | H. G. Acid Phosphate 16%.....                                               | Bourland Bros., Amory.....          |
|                    |                                                                             | Guarantee.....                      |
| 13362              | S. G. Bourland's Cotton Grower                                              | Bourland Bros., Amory.....          |
| 14469              | S. G. Bourland's Cotton Grower                                              | Bourland Bros., Amory.....          |
| 14585              | S. G. Bourland's Cotton Grower                                              | Bourland Bros., Amory.....          |
|                    |                                                                             | Average .....                       |
|                    |                                                                             | Guarantee.....                      |
| 14468              | H. G. Special Truck Grower ..                                               | Bourland Bros., Amory.....          |
|                    |                                                                             | Guarantee.....                      |
| 14586              | S. G. Kainit .....                                                          | Bourland Bros., Amory.....          |
|                    |                                                                             | Guarantee.....                      |
|                    | <b>BIRMINGHAM FERTILIZER CO.,</b><br>Birmingham, Ala.                       |                                     |
| 13363              | Monarch Extra H. G. Acid<br>Phosphate 16% .....                             | Florence Merc. Co., Florence.....   |
| 14587              | Monarch Extra H. G. Acid<br>Phosphate 16% .....                             | Florence Merc. Co., Florence.....   |
|                    |                                                                             | Average .....                       |
|                    |                                                                             | Guarantee.....                      |
| 13364              | Birmingham H. G. Fertilizer ..                                              | J. A. Mayfield, Amory.....          |
| 14588              | Birmingham H. G. Fertilizer ..                                              | J. A. Mayfield, Amory.....          |
| 14589              | Birmingham H. G. Fertilizer ..                                              | J. A. Lowe & Co., Nettleton.....    |
|                    |                                                                             | Average .....                       |
|                    |                                                                             | Guarantee.....                      |
| 13365              | S. G. Monarch Meal Mixture ..                                               | J. A. Mayfield, Amory.....          |
| 13366              | S. G. Monarch Meal Mixture ..                                               | Florence Merc. Co., Florence.....   |
| 14590              | S. G. Monarch Meal Mixture ..                                               | Florence Merc. Co., Florence.....   |
| 14591              | S. G. Monarch Meal Mixture ..                                               | J. S. Eaton & Bro., Taylorsville .. |
|                    |                                                                             | Average .....                       |
|                    |                                                                             | Guarantee.....                      |
|                    | <b>BROOKHAVEN COTTON OIL &amp;<br/>FERTILIZER CO.,</b><br>Brookhaven, Miss. |                                     |
| 13367              | H. G. Acid Phosphate 14%.....                                               | S. S. Dale & Sons, Prentiss.....    |
| 14592              | H. G. Acid Phosphate 14%.....                                               | W. F. Boone, Monticello.....        |
| 14593              | H. G. Acid Phosphate 14%.....                                               | W. J. Carter, Bassfield.....        |
|                    |                                                                             | Average .....                       |
|                    |                                                                             | Guarantee.....                      |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14583              | 11.10              | 6.07                    | 3.61                      | 9.68                | 1.30                | 1.52               | 1.88             | 19.60                   |
|                    |                    | 5.00                    | 3.00                      | 8.00                | 2.00                | 1.65               | 2.00             | 18.31                   |
| 14584              | 3.72               |                         |                           |                     |                     |                    | 12.64            | 12.64                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13361              | 18.47              | 10.83                   | 2.72                      | 13.55               | 2.09                |                    |                  | 14.63                   |
|                    |                    | 11.00                   | 5.00                      | 16.00               | 1.00                |                    |                  | 17.10                   |
| 13362              | 13.35              | 7.39                    | 2.07                      | 9.46                | 5.38                | 1.02               | 2.45             | 17.93                   |
| 14469              | 11.10              | 5.73                    | 3.84                      | 9.57                | 3.11                | 1.53               | 2.65             | 20.25                   |
| 14585              | 12.34              | 4.71                    | 3.62                      | 8.33                | 3.39                | 1.41               | 2.82             | 18.45                   |
|                    | <b>12.26</b>       | <b>5.91</b>             | <b>3.18</b>               | <b>9.12</b>         | <b>3.96</b>         | <b>1.32</b>        | <b>2.61</b>      | <b>18.88</b>            |
|                    |                    | 5.00                    | 3.00                      | 8.00                | 1.00                | 1.65               | 3.00             | 19.31                   |
| 14468              | 8.90               | 7.84                    | 3.14                      | 10.98               | .89                 | 2.39               | 5.96             | 28.98                   |
|                    |                    | <b>6.00</b>             | <b>4.00</b>               | <b>10.00</b>        | <b>1.00</b>         | <b>2.47</b>        | <b>5.00</b>      | <b>27.10</b>            |
| 14586              | 7.35               |                         |                           |                     |                     |                    | 12.12            | 12.12                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13363              | 13.45              | 11.23                   | 4.70                      | 15.93               | .29                 |                    |                  | 17.05                   |
| 14587              | 16.02              | 13.19                   | 2.86                      | 16.05               | .55                 |                    |                  | 17.37                   |
|                    | <b>14.73</b>       | <b>12.21</b>            | <b>3.78</b>               | <b>15.99</b>        | <b>.42</b>          |                    |                  | <b>17.21</b>            |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 2.00                |                    |                  | 17.40                   |
| 13364              | 11.07              | 7.73                    | 3.16                      | 10.89               | .26                 | 1.62               | 2.08             | 21.72                   |
| 14588              | 10.90              | 7.68                    | 3.53                      | 11.21               | .19                 | 1.38               | 1.82             | 20.78                   |
| 14589              | 12.07              | 7.53                    | 3.79                      | 11.32               | .15                 | 1.45               | 1.88             | 21.25                   |
|                    | <b>11.35</b>       | <b>7.65</b>             | <b>3.49</b>               | <b>11.14</b>        | <b>.20</b>          | <b>1.48</b>        | <b>1.93</b>      | <b>21.25</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.81                   |
| 13365              | 11.76              | 7.87                    | 2.98                      | 10.85               | .48                 | 1.98               | 1.83             | 22.97                   |
| 13366              | 10.60              | 6.93                    | 3.23                      | 10.16               | .36                 | 1.47               | 1.59             | 19.71                   |
| 14590              | 11.76              | 6.76                    | 2.69                      | 9.45                | .15                 | 1.84               | 1.48             | 20.37                   |
| 14591              | 12.10              | 8.09                    | 2.48                      | 10.57               | .15                 | 1.78               | 1.33             | 21.33                   |
|                    | <b>11.55</b>       | <b>7.41</b>             | <b>2.85</b>               | <b>10.26</b>        | <b>.28</b>          | <b>1.77</b>        | <b>1.56</b>      | <b>21.10</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 13367              | 13.32              | 12.55                   | 2.72                      | 15.27               | 1.79                |                    |                  | 16.53                   |
| 14592              | 14.04              | 11.03                   | 4.93                      | 15.96               | .85                 |                    |                  | 17.06                   |
| 14593              | 10.56              | 11.35                   | 4.47                      | 15.82               | 1.10                |                    |                  | 16.96                   |
|                    | <b>12.64</b>       | <b>11.61</b>            | <b>4.01</b>               | <b>15.68</b>        | <b>1.24</b>         |                    |                  | <b>16.85</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                  | Where and from Whom Collected.            |
|--------------------|------------------------------------------------------------------|-------------------------------------------|
| 13587              | Brookhaven H. G. Blood & Bone .....                              | Louis Cohn & Bros., Brookhaven.....       |
| 14594              | Brookhaven H. G. Blood & Bone .....                              | Louis Cohn & Bros., Brookhaven .....      |
| 14595              | Brookhaven H. G. Blood & Bone .....                              | W. J. Carter, Bassfield.....              |
|                    |                                                                  | Average .....                             |
|                    |                                                                  | Guarantee.....                            |
| 13588              | H. G. Cotton Tail—Meal & Acid Mixture .....                      | Louis Cohn & Bros., Brookhaven.....       |
|                    |                                                                  | Guarantee.....                            |
| 13368              | S. G. New South .....                                            | W. J. Carter, Bassfield.....              |
| 13589              | S. G. New South .....                                            | Louis Cohn & Bros., Brookhaven.....       |
| 14596              | S. G. New South .....                                            | W. F. Boone, Monticello.....              |
|                    |                                                                  | Average .....                             |
|                    |                                                                  | Guarantee.....                            |
|                    | <b>CADDO FERTILIZER COMPANY</b><br>Shreveport, La.               |                                           |
| 13369              | S. G. Caddo Corn Grower .....                                    | Willie Spiers, McNeil.....                |
|                    |                                                                  | Guarantee.....                            |
|                    | <b>CANTON OIL MILL COMPANY,</b><br>Canton, Miss.                 |                                           |
| 12667              | H. G. Acid Phosphate 16% .....                                   | Canton Oil Mill Co., Canton.....          |
| 13443              | H. G. Acid Phosphate 16% .....                                   | W. H. Coulter, Canton.....                |
| 14597              | H. G. Acid Phosphate 16% .....                                   | Paragon Gin Co., Canton.....              |
| 14376              | H. G. Acid Phosphate 16% .....                                   | W. H. Coulter, Canton.....                |
| 14377              | H. G. Acid Phosphate 16% .....                                   | W. H. Coulter, Canton.....                |
|                    |                                                                  | Average .....                             |
|                    |                                                                  | Guarantee.....                            |
| 13444              | H. G. Half & Half .....                                          | W. H. Coulter, Canton.....                |
| 14598              | H. G. Half & Half .....                                          | W. H. Coulter, Canton.....                |
| 14599              | H. G. Half & Half .....                                          | Paragon Gin Co., Canton.....              |
|                    |                                                                  | Average .....                             |
|                    |                                                                  | Guarantee.....                            |
| 12668              | H. G. Paragon .....                                              | Canton Oil Mill Co., Canton.....          |
| 13445              | H. G. Paragon .....                                              | W. H. Coulter, Canton.....                |
| 14600              | H. G. Paragon .....                                              | C. W. Bacon, Vaiden.....                  |
|                    |                                                                  | Average .....                             |
|                    |                                                                  | Guarantee.....                            |
|                    | <b>CAPITAL FERTILIZER &amp; M'FG. COMPANY,</b><br>Jackson, Miss. |                                           |
| 12895              | Extra H. G. Acid Phosphate 16% .....                             | Gallaspy Bros. & Co., Union.....          |
| 12896              | Extra H. G. Acid Phosphate 16% .....                             | J. T. Lewis, Neshoba.....                 |
| 13446              | Extra H. G. Acid Phosphate 16% .....                             | Postlethwaite & Stewart Co., Natchez..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13587              | 11.90              | 7.33                    | 3.65                      | 10.98               | 1.10                | 1.66               | 1.69             | 21.56                   |
| 14594              | 10.66              | 6.85                    | 4.12                      | 10.97               | .59                 | 1.66               | 2.04             | 21.85                   |
| 14595              | 8.74               | 6.54                    | 3.87                      | 10.41               | .94                 | 1.73               | 1.99             | 21.45                   |
|                    | <b>10.42</b>       | <b>6.91</b>             | <b>3.88</b>               | <b>10.79</b>        | <b>.88</b>          | <b>1.68</b>        | <b>1.91</b>      | <b>21.62</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 2.00             | 20.81                   |
| 13588              | 12.20              | 8.38                    | 1.45                      | 9.83                | .14                 | 1.84               | 1.05             | 20.52                   |
|                    |                    | 8.50                    | 2.00                      | 10.50               | 1.00                | 2.00               | .50              | 21.40                   |
| 13368              | 10.12              | 8.02                    | 2.63                      | 10.65               | 1.43                | 1.55               | 2.42             | 21.52                   |
| 13589              | 12.42              | 8.29                    | 1.23                      | 9.52                | .13                 | 1.51               | 2.03             | 19.75                   |
| 14596              | 11.76              | 8.21                    | 1.46                      | 9.67                | .56                 | 1.71               | 1.99             | 20.72                   |
|                    | <b>11.42</b>       | <b>8.17</b>             | <b>1.77</b>               | <b>9.94</b>         | <b>.71</b>          | <b>1.59</b>        | <b>2.15</b>      | <b>20.66</b>            |
|                    |                    | 6.00                    | 3.00                      | 9.00                | 1.00                | 1.65               | 2.00             | 19.51                   |
| 13369              | 10.62              | 6.71                    | 3.00                      | 9.71                | 4.45                | 1.82               | 1.68             | 20.77                   |
|                    |                    | 5.00                    | 2.00                      | 7.00                | 1.00                | 2.05               | 1.50             | 18.41                   |
| 12667              | 9.74               | 13.67                   | 2.70                      | 16.37               | 1.40                |                    |                  | 17.74                   |
| 13443              | 11.37              | 13.29                   | 3.31                      | 16.60               | 1.36                |                    |                  | 17.93                   |
| 14597              | 12.30              | 13.52                   | 2.57                      | 16.09               | 1.28                |                    |                  | 17.44                   |
| 14376              | 12.05              | 12.16                   | 3.57                      | 15.73               | 1.90                |                    |                  | 16.95                   |
| 14377              | 12.22              | 12.79                   | 2.97                      | 15.76               | 1.86                |                    |                  | 17.04                   |
|                    | <b>11.54</b>       | <b>13.08</b>            | <b>3.03</b>               | <b>16.11</b>        | <b>1.56</b>         |                    |                  | <b>17.42</b>            |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 1.00                |                    |                  | 17.20                   |
| 13444              | 7.95               | 7.44                    | 2.49                      | 9.93                | .66                 | 3.13               | .95              | 25.92                   |
| 14598              | 9.70               | 7.21                    | 3.53                      | 10.74               | .37                 | 2.61               | .77              | 24.40                   |
| 14599              | 8.21               | 7.63                    | 2.9                       | 10.62               | .65                 | 2.90               | .71              | 25.48                   |
|                    | <b>8.62</b>        | <b>7.43</b>             | <b>3.00</b>               | <b>10.43</b>        | <b>.56</b>          | <b>2.88</b>        | <b>.81</b>       | <b>25.27</b>            |
|                    |                    | 6.50                    | 3.00                      | 9.50                | 1.00                | 3.00               | .75              | 24.60                   |
| 12668              | 6.33               | 7.74                    | 4.25                      | 11.99               | .78                 | 2.02               | .80              | 23.35                   |
| 13445              | 8.07               | 9.22                    | 2.62                      | 11.84               | .26                 | 2.20               | .96              | 24.26                   |
| 14600              | 8.05               | 9.63                    | 2.54                      | 12.17               | .99                 | 1.86               | .65              | 22.91                   |
|                    | <b>7.38</b>        | <b>8.86</b>             | <b>3.14</b>               | <b>12.00</b>        | <b>.68</b>          | <b>2.03</b>        | <b>.80</b>       | <b>23.51</b>            |
|                    |                    | 8.09                    | 4.00                      | 12.00               | 1.00                | 2.00               | .50              | 23.00                   |
| 12895              | 17.00              | 11.99                   | 2.68                      | 14.67               | .11                 |                    |                  | 15.87                   |
| 12896              | 16.78              | 12.22                   | 2.55                      | 14.77               | .10                 |                    |                  | 15.99                   |
| 13446              | 16.42              | 10.63                   | 4.93                      | 15.56               | .24                 |                    |                  | 16.62                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.         | Where and from Whom Collected.          |
|--------------------|-----------------------------------------|-----------------------------------------|
| 13548              | Extra H. G. Acid Phosphate 16%.....     | J. P. Cox Merc. Co., Braxton.....       |
| 14194              | Extra H. G. Acid Phosphate 16%.....     | Holloway & McRaney, Collins.....        |
| 13955              | Extra H. G. Acid Phosphate 16%.....     | Beaman & Co., Forest.....               |
| 13956              | Extra H. G. Acid Phosphate 16%.....     | Beaman & Co., Forest.....               |
| 13957              | Extra H. G. Acid Phosphate 16%.....     | E. P. Donald Bros., Philadelphia.....   |
| 13958              | Extra H. G. Acid Phosphate 16%.....     | E. P. Donald & Sons, Philadelphia.....  |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |
| 14601              | H. G. Acid Phosphate 14%.....           | Miss Cotton Oil Co., Grenada.....       |
| 14602              | H. G. Acid Phosphate 14%.....           | E. P. Donald & Sons, Philadelphia.....  |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |
| 13052              | S. G. Capital Blood, Bone & Potash..... | Gallaspy Bros., Co., Union.....         |
| 13929              | S. G. Capital Blood, Bone & Potash..... | D. C. Griffith & Co., Silver Creek..... |
| 13930              | S. G. Capital Blood, Bone & Potash..... | D. C. Griffith & Co., Silver Creek..... |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |
| 14196              | S. G. Capital Early Producer .....      | Holloway & McRaney, Collins .....       |
| 13447              | S. G. Capital Early Producer .....      | Postlewaite & Stewart Co., Natchez..... |
| 14603              | S. G. Capital Early Producer .....      | D. C. Griffith & Co., Silver Creek..... |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |
| 12897              | S. G. Cotton Elevator .....             | Gallaspy Bros., & Co., Union.....       |
| 13807              | S. G. Cotton Elevator .....             | W. H. Gallaspy's Sons Co., Hickory..... |
| 14604              | S. G. Cotton Elevator .....             | R. C. Cooper, Morton.....               |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |
| 12898              | S. G. Nonpariel .....                   | Gallaspy Bros. & Co., Union.....        |
| 12899              | S. G. Nonpariel .....                   | J. T. Lewis, Neshoba.....               |
| 13053              | S. G. Nonpariel .....                   | E. P. Donald & Sons, Philadelphia.....  |
| 13102              | S. G. Nonpariel .....                   | Capital Fert. & M'fg. Co., Jackson..... |
| 13370              | S. G. Nonpariel .....                   | The Rankin Co., Columbia.....           |
| 13448              | S. G. Nonpariel .....                   | W. G. Brown & Bro., Pinola.....         |
| 13449              | S. G. Nonpariel .....                   | Brandon Merc. Co., Brandon.....         |
| 13450              | S. G. Nonpariel .....                   | R. L. Simmons, Newton.....              |
| 13931              | S. G. Nonpariel .....                   | Meadow-Thompson & Co., Arm.....         |
| 13932              | S. G. Nonpariel .....                   | Meadow-Thompson & Co., Arm.....         |
| 13959              | S. G. Nonpariel .....                   | W. H. Gallaspy's Sons Co., Hickory..... |
| 13960              | S. G. Nonpariel .....                   | W. H. Gallaspy's Sons Co., Hickory..... |
|                    |                                         | Average .....                           |
|                    |                                         | Guarantee .....                         |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13548              | 17.90              | 11.38                   | 4.02                      | 15.40               | .09                 |                    |                  | 16.54                   |
| 14194              | 9.50               | 14.67                   | 2.55                      | 17.22               | .15                 |                    |                  | 18.69                   |
| 13955              | 15.97              | 12.08                   | 4.25                      | 16.33               | .18                 |                    |                  | 17.54                   |
| 13956              | 15.05              | 12.17                   | 3.94                      | 16.11               | .11                 |                    |                  | 17.33                   |
| 13957              | 15.15              | 12.93                   | 3.14                      | 16.07               | .09                 |                    |                  | 17.36                   |
| 13958              | 14.62              | 12.85                   | 3.19                      | 16.04               | .15                 |                    |                  | 17.33                   |
|                    | <b>15.38</b>       | <b>12.32</b>            | <b>3.46</b>               | <b>15.78</b>        | <b>.13</b>          |                    |                  | <b>17.03</b>            |
|                    |                    | <i>12.00</i>            | <i>4.00</i>               | <i>16.00</i>        | <i>1.00</i>         |                    |                  | <i>17.20</i>            |
| 14601              | 8.28               | 10.84                   | 3.44                      | 14.28               | .18                 |                    |                  | 15.36                   |
| 14602              | 11.64              | 11.30                   | 3.07                      | 14.37               | .14                 |                    |                  | 15.50                   |
|                    | <b>9.96</b>        | <b>11.07</b>            | <b>3.25</b>               | <b>14.32</b>        | <b>.16</b>          |                    |                  | <b>15.43</b>            |
|                    |                    | <i>10.00</i>            | <i>4.00</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>15.00</i>            |
| 13052              | 12.29              | 6.53                    | 2.30                      | 8.83                | .10                 | 2.45               | 2.07             | 22.85                   |
| 13929              | 11.92              | 7.48                    | 1.42                      | 8.90                | .13                 | 1.40               | 1.73             | 18.22                   |
| 13930              | 13.00              | 8.37                    | 1.62                      | 9.99                | .13                 | 1.36               | 1.40             | 19.01                   |
|                    | <b>12.40</b>       | <b>7.46</b>             | <b>1.78</b>               | <b>9.24</b>         | <b>.12</b>          | <b>1.73</b>        | <b>1.73</b>      | <b>20.04</b>            |
|                    |                    | <i>6.50</i>             | <i>2.50</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>19.56</i>            |
| 14196              | 10.52              | 9.78                    | 1.95                      | 11.73               | .34                 | 1.70               | .70              | 21.81                   |
| 13447              | 10.55              | 6.41                    | 2.70                      | 9.11                | .13                 | 2.20               | .89              | 20.90                   |
| 14603              | 13.16              | 9.62                    | 2.27                      | 11.89               | .15                 | 2.00               | .92              | 23.46                   |
|                    | <b>11.41</b>       | <b>8.60</b>             | <b>2.31</b>               | <b>10.91</b>        | <b>.21</b>          | <b>1.97</b>        | <b>.84</b>       | <b>22.06</b>            |
|                    |                    | <i>6.50</i>             | <i>3.00</i>               | <i>9.50</i>         | <i>1.00</i>         | <i>2.00</i>        | <i>.50</i>       | <i>20.10</i>            |
| 12897              | 13.20              | 6.59                    | 1.92                      | 8.51                | .38                 | 2.02               | 2.09             | 20.74                   |
| 13807              | 11.97              | 6.75                    | 1.81                      | 8.56                | .13                 | 1.72               | 3.42             | 20.86                   |
| 14604              | 13.06              | 7.03                    | 2.03                      | 9.06                | .10                 | 1.77               | 2.02             | 20.21                   |
|                    | <b>12.74</b>       | <b>6.79</b>             | <b>1.92</b>               | <b>8.71</b>         | <b>.20</b>          | <b>1.84</b>        | <b>2.51</b>      | <b>20.60</b>            |
|                    |                    | <i>6.50</i>             | <i>2.50</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>19.56</i>            |
| 12898              | 13.83              | 6.31                    | 1.35                      | 7.66                | .36                 | 2.18               | 2.48             | 20.80                   |
| 12899              | 11.61              | 8.19                    | 1.59                      | 9.78                | .27                 | 2.10               | 2.56             | 23.06                   |
| 13052              | 14.39              | 6.28                    | 2.53                      | 8.81                | .10                 | 2.44               | 2.91             | 23.60                   |
| 13102              | 12.89              | 6.88                    | 2.70                      | 9.58                | .03                 | 2.11               | 2.76             | 22.95                   |
| 13370              | 12.22              | 7.11                    | 2.90                      | 10.01               | .57                 | 1.74               | 2.28             | 21.40                   |
| 13448              | 13.08              | 6.90                    | 2.51                      | 9.41                | .13                 | 1.72               | 2.33             | 20.68                   |
| 13449              | 11.05              | 7.28                    | 2.75                      | 10.03               | .20                 | 1.66               | 2.23             | 21.17                   |
| 13450              | 11.25              | 7.35                    | 2.66                      | 10.01               | .12                 | 1.64               | 2.20             | 20.92                   |
| 13931              | 12.35              | 7.42                    | 1.91                      | 9.33                | .18                 | 1.66               | 2.00             | 20.01                   |
| 13932              | 12.10              | 6.95                    | 1.78                      | 8.73                | .19                 | 1.64               | 1.94             | 19.21                   |
| 13959              | 11.92              | 7.53                    | 2.06                      | 9.59                | .19                 | 1.61               | 1.83             | 19.97                   |
| 13960              | 11.97              | 7.81                    | 2.40                      | 10.21               | .15                 | 1.62               | 1.91             | 20.81                   |
|                    | <b>12.39</b>       | <b>7.17</b>             | <b>2.26</b>               | <b>9.43</b>         | <b>.21</b>          | <b>1.85</b>        | <b>2.28</b>      | <b>21.22</b>            |
|                    |                    | <i>6.50</i>             | <i>2.50</i>               | <i>9.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>19.56</i>            |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                                             | Where and from Whom Collected.                                    |
|--------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 14378              | S. G. Red Star Guano .....                                                                  | T. S. Turner, Canton .....                                        |
| 14379              | S. G. Red Star Guano .....                                                                  | T. S. Turner, Canton .....                                        |
| 13371              | S. G. Red Star Guano .....                                                                  | J. M. McGehee & Sons, Summit .....                                |
| 14605              | S. G. Red Star Guano .....                                                                  | Loper Merc. Co., Lake .....                                       |
| 14606              | S. G. Red Star Guano .....                                                                  | J. B. Mitchell, Ackerman .....                                    |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 13451              | S. G. German Kainit .....                                                                   | J. B. Mitchell, Ackerman .....                                    |
|                    |                                                                                             | Guarantee .....                                                   |
|                    | <b>CRYSTAL SPRINGS OIL MILL,<br/>FERT. &amp; M'F'G. COMPANY,<br/>Crystal Springs, Miss.</b> |                                                                   |
| 14607              | H. G. A. & K. Mixture .....                                                                 | Lotterhos & Huber Co., Crystal Sp'gs. ....                        |
| 14608              | H. G. A. & K. Mixture .....                                                                 | Lotterhos & Huber Co., Crystal Sp'gs. ....                        |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 12669              | S. G. Crystal Springs .....                                                                 | Crystal Sp'gs Oil Mill, Fert. & M'f'g. Co., Crystal Springs ..... |
| 14609              | S. G. Crystal Springs .....                                                                 | Alford & Miller, Gallman .....                                    |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 13372              | H. G. Crystal Vege. Grower .....                                                            | Lotterhos & Huber Co., Crystal Sp'gs .....                        |
| 14610              | H. G. Crystal Vege. Grower .....                                                            | Lotterhos & Huber Co., Crystal Sp'gs .....                        |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 13373              | S. G. L. & H.'s Cotton Fert. ....                                                           | Lotterhos & Huber Co., Crystal Sp'gs .....                        |
| 14611              | S. G. L. & H.'s Cotton Fert. ....                                                           | Lotterhos & Huber Co., Crystal Sp'gs .....                        |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
|                    | <b>EAGLE COTTON OIL COMPANY,<br/>Meridian, Miss.</b>                                        |                                                                   |
| 13452              | Eagle H. G. Phosphate 16% .....                                                             | H. N. Stuart & Sons, Morton .....                                 |
| 14612              | Eagle H. G. Phosphate 16% .....                                                             | R. W. Fagan & Co., Waynesboro .....                               |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 12848              | Eagle H. G. Phosphate 14% .....                                                             | Forest Gin & M'f'g. Co., Forest .....                             |
| 14613              | Eagle H. G. Phosphate 14% .....                                                             | Jas. O'Connell, Purvis .....                                      |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 13374              | H. G. Farm Mixture .....                                                                    | A. Roberts & Co., Lauderdale .....                                |
| 14614              | H. G. Farm Mixture .....                                                                    | R. W. Fagan & Co., Waynesboro .....                               |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |
| 13453              | S. G. Farm Mixture .....                                                                    | Forest Gin & M'f'g. Co., Forest .....                             |
| 13961              | S. G. Farm Mixture .....                                                                    | W. H. Gallaspy's Sons Co., Hickory .....                          |
| 13962              | S. G. Farm Mixture .....                                                                    | W. H. Gallaspy's Sons Co., Hickory .....                          |
|                    |                                                                                             | Average .....                                                     |
|                    |                                                                                             | Guarantee .....                                                   |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14378              | 12.72              | 7.59                    | 2.16                      | 9.75                | .19                 | 1.61               | 2.11             | 20.44                   |
| 14379              | 11.70              | 7.90                    | 2.24                      | 10.14               | .11                 | 1.69               | 2.07             | 21.20                   |
| 13371              | 11.45              | 6.52                    | 2.50                      | 9.02                | .10                 | 2.09               | 2.99             | 22.45                   |
| 14605              | 14.94              | 7.12                    | 1.92                      | 9.04                | .08                 | 1.89               | 1.99             | 20.68                   |
| 14606              | 13.42              | 7.37                    | 2.07                      | 9.44                | .17                 | 1.51               | 2.02             | 19.56                   |
|                    | <b>12.85</b>       | <b>7.30</b>             | <b>2.18</b>               | <b>9.48</b>         | <b>.13</b>          | <b>1.76</b>        | <b>2.24</b>      | <b>20.87</b>            |
|                    |                    | 6.50                    | 2.50                      | 9.00                | 1.00                | 1.65               | 2.00             | 19.56                   |
| 13451              | 5.80               |                         |                           |                     |                     |                    | 12.29            | 12.29                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 14607              | 13.14              | 7.36                    | 2.96                      | 10.32               | .34                 |                    | 4.03             | 16.12                   |
| 14608              | 8.84               | 9.04                    | 3.61                      | 12.65               | .24                 |                    | 3.26             | 18.08                   |
|                    | <b>10.99</b>       | <b>8.20</b>             | <b>3.29</b>               | <b>11.49</b>        | <b>.29</b>          |                    | <b>3.65</b>      | <b>17.10</b>            |
|                    |                    | 8.00                    | 2.50                      | 10.50               | 1.00                |                    | 3.50             | 15.85                   |
| 12669              | 9.89               | 6.88                    | 2.87                      | 9.75                | .46                 | 1.97               | 2.11             | 21.90                   |
| 14609              | 11.54              | 6.86                    | 2.99                      | 9.85                | .27                 | 1.74               | 2.40             | 21.32                   |
|                    | <b>10.71</b>       | <b>6.87</b>             | <b>2.93</b>               | <b>9.80</b>         | <b>.37</b>          | <b>1.86</b>        | <b>2.25</b>      | <b>21.61</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.75             | 19.36                   |
| 13372              | 10.40              | 5.18                    | 2.73                      | 7.91                | .28                 | 2.68               | 5.10             | 25.71                   |
| 14610              | 11.24              | 5.69                    | 2.98                      | 8.67                | .79                 | 2.72               | 4.82             | 26.49                   |
|                    | <b>10.82</b>       | <b>5.44</b>             | <b>2.85</b>               | <b>8.29</b>         | <b>.53</b>          | <b>2.70</b>        | <b>4.96</b>      | <b>26.10</b>            |
|                    |                    | 4.00                    | 2.00                      | 6.00                | .50                 | 2.75               | 3.50             | 22.19                   |
| 13373              | 11.80              | 6.88                    | 3.26                      | 10.14               | .28                 | 1.87               | 2.35             | 22.14                   |
| 14611              | 11.47              | 6.05                    | 2.98                      | 9.03                | .46                 | 2.10               | 2.43             | 21.89                   |
|                    | <b>11.63</b>       | <b>6.46</b>             | <b>3.12</b>               | <b>9.58</b>         | <b>.36</b>          | <b>1.99</b>        | <b>2.39</b>      | <b>22.02</b>            |
|                    |                    | 5.50                    | 2.50                      | 8.00                | .75                 | 1.70               | 2.00             | 18.58                   |
| 13452              | 14.71              | 13.11                   | 3.57                      | 16.68               | .50                 |                    |                  | 17.99                   |
| 14612              | 11.12              | 13.51                   | 3.58                      | 17.09               | 1.03                |                    |                  | 18.44                   |
|                    | <b>12.91</b>       | <b>13.31</b>            | <b>3.58</b>               | <b>16.89</b>        | <b>.76</b>          |                    |                  | <b>18.22</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 12848              | 11.79              | 10.19                   | 4.65                      | 14.84               | .38                 |                    |                  | 15.86                   |
| 14613              | 17.60              | 9.99                    | 3.12                      | 13.11               | 1.71                |                    |                  | 14.11                   |
|                    | <b>14.69</b>       | <b>10.09</b>            | <b>3.89</b>               | <b>13.98</b>        | <b>1.04</b>         |                    |                  | <b>14.99</b>            |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 1.00                |                    |                  | 15.00                   |
| 13374              | 14.05              | 8.89                    | 2.65                      | 11.54               | .38                 | 1.39               | 2.00             | 21.49                   |
| 14614              | 14.89              | 8.09                    | 2.00                      | 10.09               | .82                 | 1.67               | 2.18             | 21.19                   |
|                    | <b>14.47</b>       | <b>8.49</b>             | <b>2.33</b>               | <b>10.82</b>        | <b>.60</b>          | <b>1.53</b>        | <b>2.09</b>      | <b>21.34</b>            |
|                    |                    | 7.50                    | 2.50                      | 10.00               | 1.00                | 1.65               | 2.00             | 20.76                   |
| 13453              | 11.12              | 7.32                    | 2.09                      | 9.41                | 3.21                | 1.60               | 2.43             | 20.31                   |
| 13961              | 11.52              | 7.19                    | 2.36                      | 9.55                | 2.59                | 1.55               | 2.34             | 20.15                   |
| 13962              | 11.50              | 7.09                    | 2.10                      | 9.19                | 2.79                | 1.50               | 2.59             | 19.78                   |
|                    | <b>11.38</b>       | <b>7.20</b>             | <b>2.18</b>               | <b>9.38</b>         | <b>2.86</b>         | <b>1.55</b>        | <b>2.45</b>      | <b>20.08</b>            |
|                    |                    | 6.00                    | 2.00                      | 8.00                | .50                 | 1.65               | 2.00             | 18.41                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                        | Where and from Whom Collected.                  |
|--------------------|--------------------------------------------------------|-------------------------------------------------|
|                    | <b>FEDERAL CHEMICAL CO.,<br/>Louisville, Ky.</b>       |                                                 |
| 14615              | S. G. Daybreak Red Rooster ...                         | W. R. Bruce, Sherman.....                       |
| 14616              | S. G. Daybreak Red Rooster ...                         | East, Wingo & Co., Toccopola.....               |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
|                    | <b>FLORENCE COTTON OIL CO.,<br/>Florence, Ala.</b>     |                                                 |
| 13431              | H. G. Liberty Acid Phos. 16%.....                      | Farmers Warehouse Co., Pelahatchie *            |
| 13841              | H. G. Liberty Acid Phos. 16%.....                      | Farmers Warehouse Co., Pelahatchie *            |
| 13840              | H. G. Liberty Acid Phos. 16%.....                      | Farmers Warehouse Co., Pelahatchie..            |
| 14617              | H. G. Liberty Acid Phos. 16%.....                      | B. M. Smith, Houston.....                       |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
| 13432              | H. G. Liberty Dissolved Bone<br>14%.....               | Farmers Union Warehouse Co., Pelahatchie .....  |
| 14618              | H. G. Liberty Dissolved Bone<br>14%.....               | Farmers Union Warehouse Co., Philadelphia ..... |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
| 14619              | S. G. Liberty Blood & Bone .....                       | W. K. Mashburn, Agent, Meridian....             |
| 14620              | S. G. Liberty Blood & Bone .....                       | B. M. Smith, Houston.....                       |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
| 13433              | H. G. Liberty Cotton Grower .....                      | Farmers Union Wse. Co., Pelahatchie             |
| 14621              | H. G. Liberty Cotton Grower .....                      | Farmers Union Wse. Co., Pelahatchie             |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
| 14622              | O. G. Liberty Cottonseed<br>Meal and Bone .....        | W. K. Mashburn, Agent, Meridian .....           |
| 14623              | O. G. Liberty Cottonseed<br>Meal and Bone .....        | W. K. Mashburn, Agent, Meridian....             |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
| 13434              | H. G. Liberty Special .....                            | Farmers Union Wse. Co., Pelahatchie             |
| 14624              | H. G. Liberty Special .....                            | Farmers Union Wse. Co., Pelahatchie             |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |
|                    | <b>A. H. GEORGE &amp; COMPANY,<br/>Meridian, Miss.</b> |                                                 |
| 14625              | George's H. G. Acid Phos. 16%.....                     | J. K. Kirkland, Quitman.....                    |
| 14626              | George's H. G. Acid Phos. 16%.....                     | Winner Klein & Co., Meridian.....               |
|                    |                                                        | Average .....                                   |
|                    |                                                        | Guarantee.....                                  |

\* 13431 and 13841 drawn from same shipment.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14615              | 8.67               | 6.68                    | 4.04                      | 10.72               | 1.39                | 1.74               | 1.72             | 21.58                   |
| 14616              | 7.66               | 7.48                    | 2.99                      | 10.47               | 1.82                | 2.11               | 1.61             | 22.84                   |
|                    | <b>8.16</b>        | <b>7.08</b>             | <b>3.52</b>               | <b>10.60</b>        | <b>1.60</b>         | <b>1.93</b>        | <b>1.66</b>      | <b>22.21</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 20.31                   |
| 13431              | 14.42              | 11.16                   | 2.96                      | 14.12               | 2.62                |                    |                  | 15.24                   |
| 13841              | 14.92              | 11.05                   | 2.94                      | 13.99               | 3.09                |                    |                  | 15.10                   |
| 13840              | 13.97              | 12.65                   | 3.07                      | 15.72               | 1.11                |                    |                  | 16.99                   |
| 14617              | 12.63              | 11.84                   | 3.77                      | 15.61               | 1.28                |                    |                  | 16.76                   |
|                    | <b>13.98</b>       | <b>11.68</b>            | <b>3.18</b>               | <b>14.86</b>        | <b>2.02</b>         |                    |                  | <b>16.03</b>            |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                   |
| 13432              | 16.87              | 10.94                   | 2.94                      | 13.88               | 2.21                |                    |                  | 14.97                   |
| 14618              | 13.08              | 11.17                   | 3.44                      | 14.61               | 2.04                |                    |                  | 15.73                   |
|                    | <b>14.97</b>       | <b>11.06</b>            | <b>3.19</b>               | <b>14.25</b>        | <b>2.12</b>         |                    |                  | <b>15.35</b>            |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 14619              | 15.64              | 7.55                    | 4.04                      | 11.59               | 1.53                | 1.35               | 1.44             | 20.68                   |
| 14620              | 10.68              | 8.04                    | 3.33                      | 11.37               | 1.44                | 1.53               | 1.19             | 21.00                   |
|                    | <b>13.16</b>       | <b>7.79</b>             | <b>3.69</b>               | <b>11.48</b>        | <b>1.48</b>         | <b>1.44</b>        | <b>1.31</b>      | <b>20.84</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 13433              | 16.00              | 8.67                    | 2.16                      | 10.83               | 1.77                | 1.42               |                  | 18.82                   |
| 14621              | 13.25              | 8.13                    | 3.92                      | 12.05               | 1.58                | 1.48               |                  | 20.36                   |
|                    | <b>14.62</b>       | <b>8.40</b>             | <b>3.04</b>               | <b>11.44</b>        | <b>1.67</b>         | <b>1.45</b>        |                  | <b>19.59</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                | 1.65               |                  | 21.21                   |
| 14622              | 16.57              | 8.51                    | 3.42                      | 11.93               | 1.24                | 1.64               | 2.10             | 23.04                   |
| 14623              | 15.58              | 7.97                    | 3.01                      | 10.98               | 1.14                | 1.44               | 1.02             | 20.02                   |
|                    | <b>16.07</b>       | <b>8.24</b>             | <b>3.22</b>               | <b>11.46</b>        | <b>1.19</b>         | <b>1.54</b>        | <b>1.56</b>      | <b>21.53</b>            |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00                | 1.65               |                  | 17.91                   |
| 13434              | 12.55              | 8.93                    | 2.10                      | 11.03               | .98                 | 1.45               | 2.17             | 21.36                   |
| 14624              | 13.01              | 8.51                    | 2.67                      | 11.18               | .61                 | 1.13               | 2.48             | 20.43                   |
|                    | <b>12.78</b>       | <b>8.72</b>             | <b>2.38</b>               | <b>11.10</b>        | <b>.79</b>          | <b>1.29</b>        | <b>2.32</b>      | <b>20.90</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.81                   |
| 14625              | 14.75              | 9.06                    | 4.51                      | 13.57               | .27                 |                    |                  | 14.48                   |
| 14626              | 14.20              | 9.53                    | 5.27                      | 14.80               | .75                 |                    |                  | 15.75                   |
|                    | <b>14.47</b>       | <b>9.30</b>             | <b>4.89</b>               | <b>14.19</b>        | <b>.51</b>          |                    |                  | <b>15.12</b>            |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 2.00                |                    |                  | 17.40                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                      | Where and from Whom Collected.            |
|--------------------|----------------------------------------------------------------------|-------------------------------------------|
| 13375              | George's H. G. Acid Phos. ....                                       | Winner Klein & Co., Meridian .....        |
| 14627              | George's H. G. Acid Phos. ....                                       | Winner Klein & Co., Meridian .....        |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |
| 12670              | S. G. George's Cotton King .....                                     | A. H. George & Co., Meridian .....        |
| 13843              | S. G. George's Cotton King .....                                     | Myer Bros., Meridian .....                |
| 13844              | S. G. George's Cotton King .....                                     | Myer Bros., Meridian .....                |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |
| 13376              | S. G. George's Cotton Manure .....                                   | Winner Klein & Co., Meridian .....        |
| 14628              | S. G. George's Cotton Manure .....                                   | Winner Klein & Co., Meridian .....        |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |
|                    | <b>GREAT SOUTHERN PHOSPHATE<br/>COMPANY,<br/>Mt. Pleasant, Tenn.</b> |                                           |
| 12849              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Union Warehouse Co., Forest ..... |
| 13054              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Osyka * .....      |
| 13554              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Osyka * .....      |
| 13055              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Richton .....      |
| 13454              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Ackerman .....     |
| 13549              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Amory .....        |
| 13911              | Great Southern H. G. Special<br>Acid Phosphate .....                 | H. C. Lane, New Hebron .....              |
| 13898              | Great Southern H. G. Special<br>Acid Phosphate .....                 | Farmers Warehouse Co., Mize .....         |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |
| 12996              | H. G. Best by Test .....                                             | Farmers Union Warehouse Co., Forest ..... |
| 13014              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Eupora .....       |
| 13056              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Richton .....      |
| 13455              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Ackerman .....     |
| 13550              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Amory .....        |
| 13899              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Mize .....         |
| 14238              | H. G. Best by Test .....                                             | Farmers Warehouse Co., Mize .....         |
| 14258              | H. G. Best by Test .....                                             | C. L. Frazier, McCool .....               |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |
| 13015              | S. G. Farmer's Favorite .....                                        | Farmers Warehouse Co., Eupora .....       |
| 14629              | S. G. Farmers' Favorite .....                                        | Farmers Union Wse. Ass'n., Corinth .....  |
|                    |                                                                      | Average .....                             |
|                    |                                                                      | Guarantee .....                           |

\* 13054 and 13554 taken from same shipment.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13375              | 17.12              | 11.23                   | 3.68                      | 14.91               | .26                 |                    |                  | 16.03                   |
| 14627              | 14.27              | 9.64                    | 6.38                      | 16.02               | .54                 |                    |                  | 16.98                   |
|                    | <b>15.69</b>       | <b>10.44</b>            | <b>5.03</b>               | <b>15.47</b>        | <b>.40</b>          |                    |                  | <b>16.51</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 12670              | 12.53              | 6.38                    | 3.86                      | 10.24               | .75                 | 1.68               | 2.07             | 21.11                   |
| 13843              | 14.31              | 6.53                    | 5.24                      | 11.77               | .60                 | 1.36               | 1.84             | 21.22                   |
| 13844              | 13.47              | 8.36                    | 2.71                      | 11.07               | .55                 | 1.31               | 2.09             | 20.67                   |
|                    | <b>13.43</b>       | <b>7.09</b>             | <b>3.94</b>               | <b>11.03</b>        | <b>.63</b>          | <b>1.45</b>        | <b>2.00</b>      | <b>21.00</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.50               | 2.00             | 20.18                   |
| 13376              | 14.40              | 8.92                    | 2.62                      | 11.54               | .18                 | 1.07               | 1.88             | 20.01                   |
| 14628              | 17.45              | 8.19                    | 3.44                      | 11.63               | .33                 | 1.07               | 1.76             | 19.92                   |
|                    | <b>15.92</b>       | <b>8.56</b>             | <b>3.03</b>               | <b>11.59</b>        | <b>.25</b>          | <b>1.07</b>        | <b>1.82</b>      | <b>19.97</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.50               | 2.00             | 20.18                   |
| 12849              | 11.33              | 13.07                   | 3.19                      | 16.26               | 1.26                |                    |                  | 17.57                   |
| 13054              | 16.15              | 13.09                   | 1.87                      | 14.96               | 1.52                |                    |                  | 16.27                   |
| 13554              | 15.22              | 12.95                   | 2.02                      | 14.97               | 1.63                |                    |                  | 16.27                   |
| 13055              | 12.78              | 12.65                   | 4.17                      | 16.82               | .84                 |                    |                  | 18.09                   |
| 13454              | 12.15              | 13.65                   | 3.15                      | 16.80               | 1.11                |                    |                  | 18.17                   |
| 13549              | 11.82              | 12.44                   | 4.73                      | 17.17               | .68                 |                    |                  | 18.41                   |
| 13911              | 13.59              | 13.74                   | 3.05                      | 16.79               | .75                 |                    |                  | 18.16                   |
| 13898              | 12.40              | 13.33                   | 3.61                      | 16.94               | 1.07                |                    |                  | 18.27                   |
|                    | <b>13.18</b>       | <b>13.12</b>            | <b>3.22</b>               | <b>16.34</b>        | <b>1.11</b>         |                    |                  | <b>17.65</b>            |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 2.00                |                    |                  | 17.40                   |
| 12996              | 9.77               | 6.47                    | 4.39                      | 10.86               | 4.02                | 1.60               | 2.52             | 21.91                   |
| 13014              | 9.38               | 5.66                    | 5.08                      | 10.74               | 4.48                | 1.59               | 2.45             | 21.59                   |
| 13056              | 10.97              | 5.69                    | 5.00                      | 10.69               | 4.25                | 1.67               | 2.86             | 22.29                   |
| 13455              | 9.25               | 6.83                    | 4.45                      | 11.28               | 3.70                | 1.56               | 2.63             | 22.36                   |
| 13550              | 9.22               | 5.38                    | 5.63                      | 11.01               | 3.72                | 1.65               | 2.03             | 21.69                   |
| 13899              | 9.92               | 6.19                    | 4.22                      | 10.41               | 7.25                | 1.34               | 2.05             | 19.82                   |
| 14238              | 9.20               | 6.14                    | 4.58                      | 10.72               | 5.19                | 1.63               | 2.46             | 21.79                   |
| 14258              | 10.31              | 8.60                    | 4.56                      | 13.16               | 3.27                | 1.54               | 1.52             | 23.40                   |
|                    | <b>9.75</b>        | <b>6.37</b>             | <b>4.73</b>               | <b>11.10</b>        | <b>4.48</b>         | <b>1.58</b>        | <b>2.30</b>      | <b>21.86</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 5.00                | 1.65               | 2.00             | 20.71                   |
| 13015              | 10.05              | 6.58                    | 3.99                      | 10.57               | 5.42                | 1.72               | 1.36             | 20.96                   |
| 14629              | 10.00              | 6.40                    | 5.23                      | 11.63               | 5.78                | 1.60               | 1.32             | 21.55                   |
|                    | <b>10.02</b>       | <b>6.49</b>             | <b>4.61</b>               | <b>11.10</b>        | <b>5.60</b>         | <b>1.66</b>        | <b>1.34</b>      | <b>21.26</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 5.00                | 1.65               | 1.00             | 19.71                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                                           | Name of Brand and Manufacturer.            | Where and from Whom Collected.                             |
|------------------------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------|
| 13456                                                                        | H. G. General Lee Cot. Grower              | Willie Puckett, Mayton .....                               |
| 13900                                                                        | H. G. General Lee Cot. Grower              | Farmers Warehouse Co., Taylorsville                        |
| 13901                                                                        | H. G. General Lee Cot. Grower              | Farmers Warehouse Co., Mize .....                          |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 13902                                                                        | O. G. The Planters Champion...             | Farmers Warehouse Co., Taylorsville                        |
| 14630                                                                        | O. G. The Planters Champion...             | W. H. McLain, Puckett .....                                |
| 14631                                                                        | O. G. The Planters Champion...             | Farmers Warehouse Co., Pontotoc...                         |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 12850                                                                        | H. G. Superior Cotton Grower               | J. J. Gates, Crystal Springs .....                         |
|                                                                              |                                            | Guarantee .....                                            |
| 13016                                                                        | S. G. Universal Cotton Grower              | Farmers Warehouse Co., Eupora .....                        |
| 13057                                                                        | S. G. Universal Cotton Grower              | Farmers Warehouse Co., Richton .....                       |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 13551                                                                        | S. G. Kainit .....                         | Farmers Warehouse Co., Amory .....                         |
|                                                                              |                                            | Guarantee .....                                            |
| <b>GULFPORT COTTON OIL, FERTILIZER &amp; M'F'G. CO.,<br/>Gulfport, Miss.</b> |                                            |                                                            |
| 12671                                                                        | Primo H. G. Acid Phos. 16% .....           | T. S. Turner, Canton .....                                 |
| 13457                                                                        | Primo H. G. Acid Phos. 16% .....           | M. Oates, Bay Springs .....                                |
| 14632                                                                        | Primo H. G. Acid Phos. 16% .....           | C. Atkinson's Sons Co., Summit .....                       |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 12900                                                                        | Primo H. G. Acid Phos. 14% .....           | Gulfport Cot. Oil Fert. & M'f'g. Co.,<br>Gulfport .....    |
| 13458                                                                        | Primo H. G. Acid Phos. 14% .....           | Philadelphia Merc. Co., Philadelphia                       |
| 14633                                                                        | Primo H. G. Acid Phos. 14% .....           | McCrery & Co., Pachuta .....                               |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 12672                                                                        | Primo H. G. Blood & Bone .....             | T. S. Turner, Canton .....                                 |
| 12901                                                                        | Primo H. G. Blood & Bone .....             | Gulfport Cotton Oil, Fert. & M'f'g.<br>Co., Gulfport ..... |
| 14634                                                                        | Primo H. G. Blood & Bone .....             | W. M. Prine, Weathersby .....                              |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |
| 12673                                                                        | Primo S. G. C. S. Meal Com-<br>pound ..... | T. S. Turner, Canton .....                                 |
| 12902                                                                        | Primo S. G. C. S. Meal Com-<br>pound ..... | Gulfport Cotton Oil, Fert. & M'f'g.<br>Co., Gulfport ..... |
| 13459                                                                        | Primo S. G. C. S. Meal Com-<br>pound ..... | Dorsett & Company, Richton .....                           |
|                                                                              |                                            | Average .....                                              |
|                                                                              |                                            | Guarantee .....                                            |

## MISSISSIPPI EXPERIMENT STATION.

Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13456              | 9.42               | 7.28                    | 5.51                      | 12.79               | 2.91                | 1.68               | 1.37             | 23.31                   |
| 13900              | 11.67              | 8.10                    | 4.81                      | 12.91               | 2.74                | 1.47               | 1.41             | 22.67                   |
| 13901              | 9.17               | 8.61                    | 5.02                      | 13.63               | 2.76                | 1.56               | 1.00             | 23.48                   |
|                    | <b>10.08</b>       | <b>8.00</b>             | <b>5.11</b>               | <b>13.11</b>        | <b>2.80</b>         | <b>1.57</b>        | <b>1.26</b>      | <b>23.15</b>            |
|                    |                    | 8.00                    | 3.00                      | 11.00               | 5.00                | 1.65               | 1.00             | 20.91                   |
| 13902              | 10.40              | 6.53                    | 4.71                      | 11.24               | 5.97                | 1.12               | 1.34             | 19.12                   |
| 14630              | 10.03              | 5.29                    | 6.35                      | 11.64               | 5.60                | 1.11               | 1.53             | 19.58                   |
| 14631              | 8.39               | 4.41                    | 6.23                      | 10.64               | 7.39                | .95                | 1.59             | 17.77                   |
|                    | <b>9.61</b>        | <b>5.41</b>             | <b>5.76</b>               | <b>11.17</b>        | <b>6.31</b>         | <b>1.06</b>        | <b>1.49</b>      | <b>18.82</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 5.00                | .82                | 1.00             | 16.19                   |
| 12850              | 7.68               | 8.07                    | 3.46                      | 11.53               | 5.74                | 1.89               |                  | 21.52                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 2.47               |                  | 22.30                   |
| 13016              | 9.21               | 4.20                    | 4.29                      | 8.49                | 7.34                | 1.65               | 2.48             | 19.25                   |
| 13057              | 9.72               | 4.63                    | 6.70                      | 11.33               | 4.34                | 1.79               | 2.43             | 22.96                   |
|                    | <b>9.46</b>        | <b>4.42</b>             | <b>5.49</b>               | <b>9.91</b>         | <b>5.84</b>         | <b>1.72</b>        | <b>2.45</b>      | <b>21.10</b>            |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 5.00                | 1.65               | 2.00             | 18.41                   |
| 13551              | 3.81               |                         |                           |                     |                     |                    | 11.76            | 11.76                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 12671              | 12.59              | 14.77                   | 1.64                      | 16.41               | .26                 |                    |                  | 17.89                   |
| 13457              | 19.27              | 12.69                   | 2.02                      | 14.71               | .65                 |                    |                  | 15.98                   |
| 14632              | 17.20              | 14.90                   | 1.70                      | 16.60               | .20                 |                    |                  | 18.09                   |
|                    | <b>16.35</b>       | <b>14.12</b>            | <b>1.79</b>               | <b>15.91</b>        | <b>.37</b>          |                    |                  | <b>17.32</b>            |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 17.40                   |
| 12900              | 13.81              | 12.31                   | 1.50                      | 13.81               | .29                 |                    |                  | 15.04                   |
| 13458              | 15.12              | 10.80                   | 1.61                      | 12.41               | .43                 |                    |                  | 13.49                   |
| 14633              | 14.91              | 11.19                   | 2.07                      | 13.26               | .51                 |                    |                  | 14.38                   |
|                    | <b>14.95</b>       | <b>11.43</b>            | <b>1.73</b>               | <b>13.16</b>        | <b>.41</b>          |                    |                  | <b>14.30</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 1.00                |                    |                  | 15.20                   |
| 12672              | 10.85              | 9.35                    | 1.93                      | 11.28               | .41                 | 2.13               | 2.15             | 24.55                   |
| 12901              | 12.96              | 9.89                    | 1.48                      | 11.37               | .65                 | 2.18               | 2.93             | 25.69                   |
| 14634              | 13.38              | 7.72                    | 2.19                      | 9.91                | .17                 | 2.04               | 1.62             | 21.96                   |
|                    | <b>12.39</b>       | <b>8.99</b>             | <b>1.87</b>               | <b>10.86</b>        | <b>.41</b>          | <b>2.12</b>        | <b>2.23</b>      | <b>24.07</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 2.00             | 20.81                   |
| 12673              | 13.85              | 8.85                    | 1.53                      | 10.38               | .29                 | 1.47               | 2.22             | 20.77                   |
| 12902              | 14.97              | 7.78                    | 1.17                      | 8.95                | .41                 | 1.41               | 2.01             | 18.63                   |
| 13459              | 13.72              | 7.65                    | 1.71                      | 9.36                | .28                 | 1.38               | 2.50             | 19.43                   |
|                    | <b>14.18</b>       | <b>8.09</b>             | <b>1.47</b>               | <b>9.56</b>         | <b>.33</b>          | <b>1.42</b>        | <b>2.24</b>      | <b>19.61</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 2.00             | 19.61                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                            | Where and from Whom Collected.                           |
|--------------------|----------------------------------------------------------------------------|----------------------------------------------------------|
| 12674              | Primo H. G. C. S. Meal Mixture                                             | T. S. Turner, Canton.....                                |
| 14635              | Primo H. G. C. S. Meal Mixture                                             | T. M. Thames, Magee.....                                 |
| 14636              | Primo H. G. C. S. Meal Mixture                                             | W. M. Prine, Weathersby.....                             |
|                    |                                                                            | Average.....                                             |
|                    |                                                                            | Guarantee.....                                           |
| 14637              | S. G. Special Aurora .....                                                 | R. F. Waldron & Co., Arm.....                            |
| 13461              | S. G. Special Aurora .....                                                 | Spivey & Scarborough, Decatur.....                       |
|                    |                                                                            | Average.....                                             |
|                    |                                                                            | Guarantee.....                                           |
| 14638              | S. G. Special Eclipse.....                                                 | Max Priebatsch, Brookhaven.....                          |
|                    |                                                                            | Guarantee.....                                           |
| 12675              | Primo S. G. R. B. Superphos....                                            | T. S. Turner, Canton.....                                |
| 12903              | Primo S. G. R. B. Superphos....                                            | Gulfport Cotton Oil, Fert. & M'fg.<br>Co., Gulfport..... |
| 13460              | Primo S. G. R. B. Superphos....                                            | M. Oates, Bay Springs.....                               |
|                    |                                                                            | Average.....                                             |
|                    |                                                                            | Guarantee.....                                           |
| 13462              | Primo S. G. German Kainit .....                                            | Biloxi Milling Co., Biloxi.....                          |
|                    |                                                                            | Guarantee.....                                           |
|                    | <b>HAZLEHURST OIL MILL &amp; FERTILIZER COMPANY,<br/>Hazlehurst, Miss.</b> |                                                          |
| 13058              | H. G. Acid Phosphate 14%.....                                              | J. S. Varnado, Osyka.....                                |
| 14639              | H. G. Acid Phosphate 14%.....                                              | Grenada Oil Mill, Grenada.....                           |
|                    |                                                                            | Average.....                                             |
|                    |                                                                            | Guarantee.....                                           |
| 13059              | S. G. Imperial Fertilizer.....                                             | Ginn & McDonald, Tylertown.....                          |
| 13463              | S. G. Imperial Fertilizer.....                                             | W. S. Gordon, Pickens.....                               |
| 13464              | S. G. Imperial Fertilizer.....                                             | C. F. Nelson & Sons, Goodman.....                        |
| 14640              | S. G. Imperial Fertilizer.....                                             | Grenada Oil Mill, Grenada.....                           |
| 14641              | S. G. Imperial Fertilizer.....                                             | W. L. Robinson Co., Liberty.....                         |
| 14380              | S. G. Imperial Fertilizer.....                                             | Grenada Oil Mill, Grenada.....                           |
| 14381              | S. G. Imperial Fertilizer.....                                             | Grenada Oil Mill, Grenada.....                           |
| 14382              | S. G. Imperial Fertilizer.....                                             | J. L. Gallaspy, Crystal Springs.....                     |
| 14383              | S. G. Imperial Fertilizer.....                                             | J. L. Gallaspy, Crystal Springs.....                     |
|                    |                                                                            | Average.....                                             |
|                    |                                                                            | Guarantee.....                                           |
| 12678              | H. G. Imperial Vegetable<br>Grower .....                                   | Hazlehurst Oil Mill & Fert. Co.,<br>Hazlehurst .....     |
|                    |                                                                            | Guarantee.....                                           |
|                    | <b>JACKSON FERTILIZER COMPANY,<br/>Jackson, Miss.</b>                      |                                                          |
| 14384              | H. G. Acid Phosphate 16%.....                                              | Blackstone Merc. Co., Winona.....                        |
| 14385              | H. G. Acid Phosphate 16%.....                                              | Blackstone Merc. Co., Winona.....                        |
| 12851              | H. G. Acid Phosphate 16%.....                                              | T. B. Gaddis, Morton.....                                |
| 12951              | H. G. Acid Phosphate 16%.....                                              | The Lampton Co., Columbia.....                           |
| 13011              | H. G. Acid Phosphate 16%.....                                              | F. L. Riley Merc. Co., New Hebron.....                   |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12674              | 15.72              | 9.58                    | 1.36                      | 10.94               | .26                 | 1.12               | 2.19             | 19.94                   |
| 14635              | 14.11              | 8.87                    | 1.40                      | 10.27               | .26                 | 1.62               | 2.02             | 21.11                   |
| 14636              | 14.15              | 7.99                    | 1.89                      | 9.88                | .21                 | 1.48               | 1.84             | 19.80                   |
|                    | <b>14.66</b>       | <b>8.81</b>             | <b>1.55</b>               | <b>10.36</b>        | <b>.24</b>          | <b>1.41</b>        | <b>2.02</b>      | <b>20.28</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 2.00             | 20.81                   |
| 14637              | 10.38              | 6.77                    | 2.57                      | 9.34                | .35                 | 1.77               |                  | 18.47                   |
| 13461              | 15.55              | 8.41                    | 1.57                      | 9.98                | .51                 | 1.65               |                  | 18.83                   |
|                    | <b>12.96</b>       | <b>7.59</b>             | <b>2.07</b>               | <b>9.66</b>         | <b>.43</b>          | <b>1.71</b>        |                  | <b>18.65</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               |                  | 18.81                   |
| 14638              | 15.68              | 8.60                    | 1.55                      | 10.15               | .17                 | 1.62               |                  | 18.91                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 2.00               |                  | 20.30                   |
| 12675              | 14.03              | 7.86                    | 1.36                      | 9.22                | .64                 | 1.43               | 2.10             | 19.11                   |
| 12903              | 13.01              | 7.87                    | 1.57                      | 9.44                | 1.05                | 1.76               | 2.04             | 20.69                   |
| 13460              | 16.57              | 7.78                    | .82                       | 8.60                | .30                 | 2.39               | 2.30             | 22.70                   |
|                    | <b>14.54</b>       | <b>7.84</b>             | <b>1.25</b>               | <b>9.09</b>         | <b>.66</b>          | <b>1.86</b>        | <b>2.15</b>      | <b>20.83</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 2.00             | 19.61                   |
| 13462              | 7.47               |                         |                           |                     |                     |                    | 12.67            | 12.67                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13058              | 16.43              | 14.08                   | 2.67                      | 16.75               | .26                 |                    |                  | 18.16                   |
| 14639              | 10.44              | 11.45                   | 3.48                      | 14.93               | .38                 |                    |                  | 16.08                   |
|                    | <b>13.43</b>       | <b>12.77</b>            | <b>3.07</b>               | <b>15.84</b>        | <b>.32</b>          |                    |                  | <b>17.12</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 1.00                |                    |                  | 15.20                   |
| 13059              | 12.76              | 9.54                    | 2.52                      | 12.06               | .20                 | 1.59               | 2.14             | 23.12                   |
| 13463              | 12.20              | 9.40                    | 2.19                      | 11.59               | .31                 | 1.71               | 2.14             | 23.10                   |
| 13464              | 11.40              | 8.93                    | 2.62                      | 11.55               | .54                 | 1.78               | 1.95             | 23.11                   |
| 14640              | 9.94               | 8.69                    | 3.60                      | 12.29               | .10                 | 1.59               | 1.85             | 23.00                   |
| 14641              | 12.97              | 8.90                    | 2.50                      | 11.40               | .14                 | 1.70               | 1.74             | 22.40                   |
| 14380              | 10.42              | 8.56                    | 1.44                      | 10.00               | .61                 | 1.67               | 2.05             | 21.00                   |
| 14381              | 10.40              | 8.64                    | 1.58                      | 10.22               | .61                 | 1.68               | 2.04             | 21.29                   |
| 14382              | 9.02               | 7.95                    | 2.00                      | 9.95                | 1.61                | 1.65               | 1.99             | 20.74                   |
| 14383              | 9.35               | 8.60                    | 1.93                      | 10.53               | .88                 | 1.56               | 1.98             | 21.05                   |
|                    | <b>10.94</b>       | <b>8.80</b>             | <b>2.26</b>               | <b>11.06</b>        | <b>.55</b>          | <b>1.66</b>        | <b>1.98</b>      | <b>22.09</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.75             | 19.36                   |
| 12678              | 9.27               | 5.33                    | 1.92                      | 7.25                | 1.10                | 3.62               | 2.51             | 26.40                   |
|                    |                    | 4.50                    | 2.50                      | 7.00                | 1.00                | 2.50               | 2.50             | 21.28                   |
| 14384              | 14.22              | 13.01                   | 4.11                      | 17.12               | .47                 |                    |                  | 18.42                   |
| 14385              | 14.52              | 12.76                   | 4.08                      | 16.84               | .48                 |                    |                  | 18.12                   |
| 12851              | 14.56              | 15.14                   | .43                       | 15.57               | .55                 |                    |                  | 17.08                   |
| 12951              | 14.40              | 13.10                   | 2.69                      | 15.79               | .50                 |                    |                  | 17.10                   |
| 13011              | 15.11              | 14.61                   | 1.43                      | 16.04               | .39                 |                    |                  | 17.50                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.    | Where and from Whom Collected.        |
|--------------------|------------------------------------|---------------------------------------|
| 13012              | H. G. Acid Phosphate 16%           | Jackson Fert. Co., Jackson.....       |
| 13060              | H. G. Acid Phosphate 16%           | The Lampton Co., Magnolia.....        |
| 13061              | H. G. Acid Phosphate 16%           | C. W. Alexander, Montrose.....        |
| 13465              | H. G. Acid Phosphate 16%           | W. A. Dickson, Pinola.....            |
| 13466              | H. G. Acid Phosphate 16%           | T. B. Gaddis, Morton.....             |
|                    |                                    | Average.....                          |
|                    |                                    | Guarantee.....                        |
| 13933              | H. G. Red Band Acid Phosphate 16%  | F. L. Riley Merc. Co., New Hebron.... |
| 13934              | H. G. Red Band Acid Phosphate 16%  | F. L. Riley Merc. Co., New Hebron.... |
| 13377              | H. G. Red Band Acid Phosphate 16%  | Johnson-Woodward Co., Mt. Olive....   |
| 14481              | H. G. Red Band Acid Phosphate 16%  | F. L. Riley Merc. Co., New Hebron.... |
| 14482              | H. G. Red Band Acid Phosphate 16%  | The Lampton & Rawls Co., Mt. Olive    |
| 14483              | H. G. Red Band Acid Phosphate 16%  | Gaddis & Slay Co., Magee.....         |
| 14484              | H. G. Red Band Acid Phosphate 16%  | J. S. Eaton & Bro., Taylorsville..... |
| 14485              | H. G. Red Band Acid Phosphate 16%  | Lotterhos & Huber Co., Crystal Sp'gs  |
| 14486              | H. G. Red Band Acid Phosphate 16%  | C. Atkinson's Sons Co., Summit.....   |
| 14487              | H. G. Red Band Acid Phosphate 16%  | D. C. Coney, Bogue Chitto.....        |
| 14488              | H. G. Red Band Acid Phosphate 16%  | A. C. Seavey & Sons, Brookhaven.....  |
| 14489              | H. G. Red Band Acid Phosphate 16%  | R. F. Everett, Braxton.....           |
| 14490              | H. G. Red Band Acid Phosphate 16%  | E. M. Odom, Star.....                 |
| 14491              | H. G. Red Band Acid Phosphate 16%  | Johnson-Woodward Co., Mt. Olive....   |
| 14492              | H. G. Red Band Acid Phosphate 16%  | Johnson-Hand Co., Ellisville.....     |
|                    |                                    | Average.....                          |
|                    |                                    | Guarantee.....                        |
| 13017              | H. G. Acid Phosphate 14%           | The Fair Company, Louisville.....     |
| 13467              | H. G. Acid Phosphate 14%           | Walker-Durr Co., Pinola.....          |
|                    |                                    | Average.....                          |
|                    |                                    | Guarantee.....                        |
| 14642              | S. G. Black Hawk Acid Phos.        | R. F. Everett, Braxton.....           |
|                    |                                    | Guarantee.....                        |
| 14643              | S. G. Chicago R. B. Superphosphate | Johnson-Woodward Co., Mt. Olive....   |
| 14644              | S. G. Chicago R. B. Superphosphate | Gaddis & McLaurin, Raymond.....       |
|                    |                                    | Average.....                          |
|                    |                                    | Guarantee.....                        |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13012              | 15.59              | 13.92                   | 1.91                      | 15.83               | .50                 |                    |                  | 17.22                   |
| 13060              | 15.61              | 14.25                   | 2.70                      | 16.95               | .19                 |                    |                  | 18.38                   |
| 13061              | 17.17              | 14.69                   | 2.02                      | 16.71               | .22                 |                    |                  | 18.18                   |
| 13465              | 16.22              | 13.89                   | 2.81                      | 16.70               | .36                 |                    |                  | 18.09                   |
| 13466              | 16.22              | 12.42                   | 3.43                      | 15.85               | .56                 |                    |                  | 17.09                   |
|                    | <b>15.36</b>       | <b>13.78</b>            | <b>2.56</b>               | <b>16.34</b>        | <b>.42</b>          |                    |                  | <b>17.71</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 13933              | 17.40              | 12.99                   | 2.91                      | 15.90               | .38                 |                    |                  | 17.20                   |
| 13934              | 15.22              | 12.18                   | 2.77                      | 14.95               | 1.09                |                    |                  | 16.17                   |
| 13377              | 16.05              | 13.44                   | 3.35                      | 16.79               | .38                 |                    |                  | 18.13                   |
| 14481              | 14.07              | 13.13                   | 3.72                      | 16.85               | .48                 |                    |                  | 18.16                   |
| 14482              | 15.51              | 11.33                   | 4.34                      | 15.67               | .60                 |                    |                  | 16.80                   |
| 14483              | 14.24              | 13.83                   | 2.99                      | 16.82               | .57                 |                    |                  | 18.20                   |
| 14484              | 15.10              | 13.14                   | 2.87                      | 16.01               | .74                 |                    |                  | 17.32                   |
| 14485              | 16.05              | 13.78                   | 2.73                      | 16.51               | .32                 |                    |                  | 17.89                   |
| 14486              | 13.42              | 13.61                   | 3.32                      | 16.93               | .55                 |                    |                  | 18.29                   |
| 14487              | 15.63              | 12.44                   | 3.97                      | 16.41               | .38                 |                    |                  | 17.65                   |
| 14488              | 15.91              | 12.72                   | 3.35                      | 16.07               | .37                 |                    |                  | 17.34                   |
| 14489              | 14.79              | 14.54                   | 2.34                      | 16.88               | .74                 |                    |                  | 18.33                   |
| 14490              | 13.79              | 11.61                   | 4.83                      | 16.44               | .37                 |                    |                  | 17.60                   |
| 14491              | 14.55              | 13.74                   | 3.19                      | 16.93               | .38                 |                    |                  | 18.30                   |
| 14492              | 14.95              | 12.92                   | 3.45                      | 16.37               | .65                 |                    |                  | 17.66                   |
|                    | <b>15.11</b>       | <b>13.03</b>            | <b>3.34</b>               | <b>16.37</b>        | <b>.53</b>          |                    |                  | <b>17.67</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 13017              | 13.27              | 12.85                   | 3.24                      | 16.09               | 1.43                |                    |                  | 17.38                   |
| 13467              | 13.32              | 12.04                   | 3.12                      | 15.16               | .83                 |                    |                  | 16.36                   |
|                    | <b>13.29</b>       | <b>12.44</b>            | <b>3.18</b>               | <b>15.62</b>        | <b>1.13</b>         |                    |                  | <b>16.87</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 1.00                |                    |                  | 15.20                   |
| 14642              | 11.91              | 9.53                    | 4.74                      | 14.27               | .68                 |                    |                  | 15.22                   |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 1.00                |                    |                  | 13.00                   |
| 14643              | 11.35              | 6.89                    | 3.17                      | 10.06               | .38                 | 1.69               | 1.53             | 20.47                   |
| 14644              | 9.64               | 7.35                    | 2.98                      | 10.33               | .23                 | 1.71               | 1.51             | 20.88                   |
|                    | <b>10.49</b>       | <b>7.12</b>             | <b>3.07</b>               | <b>10.19</b>        | <b>.30</b>          | <b>1.70</b>        | <b>1.52</b>      | <b>20.67</b>            |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.71                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.             | Where and from Whom Collected.            |
|--------------------|---------------------------------------------|-------------------------------------------|
| 13062              | S. G. Early Dixie .....                     | Lampton Merc. Co., Magnolia.....          |
| 13468              | S. G. Early Dixie .....                     | C. W. Taylor, Pelahatchie.....            |
| 13870              | S. G. Early Dixie .....                     | J. S. Eaton & Bro., Taylorsville.....     |
| 14645              | S. G. Early Dixie .....                     | D'Lo Merc. Co., D'Lo.....                 |
|                    |                                             | Average.....                              |
|                    |                                             | Guarantee.....                            |
| 12676              | H. G. Fruit & Vegetable Fert. .             | Lotterhos & Huber Co., Crystal Sp'gs..... |
| 13868              | H. G. Fruit & Vegetable Fert. .             | W. S. Gordon, Pickens.....                |
| 14646              | H. G. Fruit & Vegetable Fert. .             | The Lampton Co., Columbia.....            |
|                    |                                             | Average.....                              |
|                    |                                             | Guarantee.....                            |
| 12852              | H. G. Huber's Veribest .....                | Lotterhos & Huber Co., Crystal Sp'gs..... |
| 14647              | H. G. Huber's Veribest .....                | Lotterhos & Huber Co., Crystal Sp'gs..... |
|                    |                                             | Average.....                              |
|                    |                                             | Guarantee.....                            |
| 14493              | S. G. Lampton's R. B. Super-phosphate ..... | The Lampton Co., Columbia.....            |
| 14494              | S. G. Lampton's R. B. Super-phosphate ..... | The Lampton Merc. Co., Magnolia.....      |
| 14495              | S. G. Lampton's R. B. Super-phosphate ..... | The Lampton Merc. Co., Magnolia.....      |
| 13935              | S. G. Lampton's R. B. Super-phosphate ..... | The Lampton Co., Columbia.....            |
| 13936              | S. G. Lampton's R. B. Super-phosphate ..... | The Lampton Co., Columbia.....            |
|                    |                                             | Average.....                              |
|                    |                                             | Guarantee.....                            |
| 13378              | S. G. New Era, Acid Meal and Mixture .....  | C. Atkinson's Sons Co., Summit.....       |
| 13826              | S. G. New Era, Acid and Meal Mixture .....  | Johnson-Hand Co., Ellisville.....         |
| 13827              | S. G. New Era, Acid and Meal Mixture .....  | R. F. Everett, Braxton.....               |
| 14648              | S. G. New Era, Acid and Meal Mixture .....  | T. W. Ford & Co., Eupora.....             |
|                    |                                             | Average.....                              |
|                    |                                             | Guarantee.....                            |
| 12677              | S. G. Royal "C" Brand .....                 | Lotterhos & Huber Co., Crystal Sp'gs..... |
| 12853              | S. G. Royal "C" Brand .....                 | T. B. Gaddis, Morton.....                 |
| 12952              | S. G. Royal "C" Brand .....                 | F. L. Riley Merc. Co., New Hebron.....    |
| 12997              | S. G. Royal "C" Brand .....                 | Story & Company, Forest.....              |
| 13018              | S. G. Royal "C" Brand .....                 | Jackson-Wallace Co., Kosciusko.....       |
| 13063              | S. G. Royal "C" Brand .....                 | W. W. Horn, Bay Springs.....              |
| 13064              | S. G. Royal "C" Brand .....                 | C. W. Alexander, Montrose.....            |
| 13469              | S. G. Royal "C" Brand .....                 | J. G. Irving, Weir.....                   |
| 13470              | S. G. Royal "C" Brand .....                 | Jackson-Wallace Co., Kosciusko.....       |
| 13471              | S. G. Royal "C" Brand .....                 | The Fair Company, Louisville.....         |
| 13472              | S. G. Royal "C" Brand .....                 | C. W. Taylor, Pelahatchie.....            |
| 13473              | S. G. Royal "C" Brand .....                 | W. S. Gordon, Pickens.....                |
| 14649              | S. G. Royal "C" Brand .....                 | The Lampton Co., Columbia.....            |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                        |
| 13062              | 11.48              | 9.08                    | 2.64                      | 11.72               | 3.44                | 2.08               | .58              | 23.22                  |
| 13468              | 10.25              | 7.95                    | 3.02                      | 10.97               | .47                 | 2.01               | .52              | 21.92                  |
| 13870              | 5.75               | 6.59                    | 2.56                      | 9.15                | .51                 | 2.80               | .29              | 22.91                  |
| 14645              | 8.25               | 5.93                    | 4.78                      | 10.71               | .61                 | 1.68               | .37              | 19.88                  |
|                    | <b>8.93</b>        | <b>7.39</b>             | <b>3.25</b>               | <b>10.64</b>        | <b>1.26</b>         | <b>2.14</b>        | <b>.44</b>       | <b>21.98</b>           |
|                    |                    | <i>8.00</i>             | <i>2.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>2.00</i>        | <i>.30</i>       | <i>20.60</i>           |
| 12676              | 10.01              | 4.46                    | 2.53                      | 6.99                | .46                 | 3.25               | 4.04             | 25.99                  |
| 13868              | 9.05               | 3.84                    | 2.00                      | 5.84                | .20                 | 3.78               | 3.93             | 26.80                  |
| 14646              | 11.56              | 6.12                    | 2.26                      | 8.38                | .26                 | 2.66               | 3.83             | 24.97                  |
|                    | <b>10.21</b>       | <b>4.81</b>             | <b>2.26</b>               | <b>7.07</b>         | <b>.31</b>          | <b>3.23</b>        | <b>3.93</b>      | <b>25.92</b>           |
|                    |                    | <i>3.00</i>             | <i>3.00</i>               | <i>6.00</i>         | <i>1.00</i>         | <i>3.00</i>        | <i>4.00</i>      | <i>25.65</i>           |
| 12852              | 10.59              | 6.11                    | 2.56                      | 8.67                | .61                 | 3.58               | 2.72             | 28.08                  |
| 14647              | 9.92               | 5.64                    | 2.37                      | 8.01                | .28                 | 3.94               | 3.06             | 29.18                  |
|                    | <b>10.25</b>       | <b>5.87</b>             | <b>2.47</b>               | <b>8.34</b>         | <b>.44</b>          | <b>3.76</b>        | <b>2.89</b>      | <b>28.63</b>           |
|                    |                    | <i>5.50</i>             | <i>2.00</i>               | <i>7.50</i>         | <i>1.00</i>         | <i>3.85</i>        | <i>3.00</i>      | <i>28.16</i>           |
| 14493              | 9.94               | 6.84                    | 3.39                      | 10.23               | .45                 | 1.75               | 1.61             | 20.98                  |
| 14494              | 10.60              | 7.21                    | 3.38                      | 10.59               | .36                 | 1.56               | 1.54             | 20.54                  |
| 14495              | 10.02              | 6.17                    | 3.98                      | 10.15               | .34                 | 1.47               | 1.61             | 19.64                  |
| 13935              | 9.15               | 5.61                    | 2.83                      | 8.44                | .82                 | 1.42               | 1.52             | 17.40                  |
| 13936              | 9.50               | 6.03                    | 3.11                      | 9.14                | .69                 | 1.32               | 1.42             | 17.69                  |
|                    | <b>9.84</b>        | <b>6.37</b>             | <b>3.34</b>               | <b>9.71</b>         | <b>.53</b>          | <b>1.50</b>        | <b>1.54</b>      | <b>19.25</b>           |
|                    |                    | <i>7.50</i>             | <i>2.00</i>               | <i>9.50</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>1.50</i>      | <i>19.71</i>           |
| 13378              | 10.35              | 8.39                    | 3.50                      | 11.89               | 5.45                | 1.56               | .36              | 20.91                  |
| 13826              | 10.31              | 7.48                    | 3.31                      | 10.79               | .37                 | 1.63               | .55              | 20.09                  |
| 13827              | 9.97               | 7.08                    | 3.43                      | 10.51               | .50                 | 1.52               | .46              | 19.19                  |
| 14648              | 14.17              | 6.08                    | 5.15                      | 11.23               | .28                 | 1.54               | .32              | 19.83                  |
|                    | <b>11.20</b>       | <b>7.26</b>             | <b>3.85</b>               | <b>11.11</b>        | <b>1.82</b>         | <b>1.56</b>        | <b>.42</b>       | <b>20.00</b>           |
|                    |                    | <i>8.00</i>             | <i>2.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>        | <i>.35</i>       | <i>19.16</i>           |
| 12677              | 11.71              | 6.39                    | 3.85                      | 10.24               | .38                 | 2.25               | 2.02             | 23.49                  |
| 12853              | 12.95              | 7.63                    | 2.43                      | 10.06               | .83                 | 1.83               | 1.81             | 21.42                  |
| 12952              | 14.91              | 8.80                    | 1.87                      | 10.67               | .37                 | 1.82               | 1.87             | 22.22                  |
| 12997              | 13.06              | 8.34                    | 2.78                      | 11.12               | .22                 | 1.85               | 2.46             | 23.39                  |
| 13018              | 14.09              | 9.31                    | 2.23                      | 11.54               | 1.39                | 1.68               | 1.81             | 22.58                  |
| 13063              | 12.82              | 7.95                    | 2.44                      | 10.39               | .42                 | 1.68               | 2.17             | 21.53                  |
| 13064              | 13.12              | 9.40                    | 2.12                      | 11.52               | .19                 | 1.71               | 2.07             | 22.95                  |
| 13469              | 12.80              | 8.56                    | 2.20                      | 10.76               | .46                 | 1.82               | 1.64             | 22.07                  |
| 13470              | 11.29              | 7.48                    | 2.68                      | 10.16               | .52                 | 1.85               | 1.79             | 21.58                  |
| 13471              | 11.65              | 8.30                    | 1.78                      | 10.08               | .55                 | 1.74               | 1.90             | 21.21                  |
| 13472              | 12.52              | 7.88                    | 1.71                      | 9.59                | .61                 | 1.65               | 1.83             | 20.18                  |
| 13473              | 13.47              | 8.62                    | 1.76                      | 10.38               | .59                 | 1.67               | 1.81             | 21.19                  |
| 14649              | 8.71               | 6.62                    | 4.12                      | 10.74               | .29                 | 1.73               | 1.51             | 21.34                  |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                       | Name of Brand and Manufacturer.  | Where and from Whom Collected.          |
|----------------------------------------------------------|----------------------------------|-----------------------------------------|
| 14650                                                    | S. G. Royal "C" Brand .....      | J. E. Singleterry & Bro., Florence..... |
| 14651                                                    | S. G. Royal "C" Brand .....      | Mathiston Merc. Co., Mathiston.....     |
| 14652                                                    | S. G. Royal "C" Brand .....      | Conner Lumber Co., Seminary.....        |
| 14653                                                    | S. G. Royal "C" Brand .....      | J. S. Eaton & Bro., Taylorsville.....   |
| 13937                                                    | S. G. Royal "C" Brand .....      | The Lampton Co., Columbia.....          |
| 13938                                                    | S. G. Royal "C" Brand .....      | The Lampton Co., Columbia.....          |
| 13939                                                    | S. G. Royal "C" Brand .....      | Johnson-Woodward Co., Mt. Olive.....    |
| 13940                                                    | S. G. Royal "C" Brand .....      | Johnson-Woodward Co., Mt. Olive.....    |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| 13065                                                    | S. G. German Kainit .....        | C. W. Alexander, Montrose.....          |
| 13379                                                    | S. G. German Kainit .....        | R. W. Fagan & Co., Waynesboro.....      |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| <b>JEFFERSON FERTILIZER CO.,</b><br>Birmingham, Ala.     |                                  |                                         |
| 14654                                                    | Excelsior H. G. Acid Phos. ....  | Bourland Bros., Amory.....              |
|                                                          |                                  | Guarantee.....                          |
| 14655                                                    | Jefferson H. G. Guano .....      | Bourland Bros., Amory.....              |
| 14656                                                    | Jefferson H. G. Guano .....      | Bourland Bros., Amory.....              |
| 14657                                                    | Jefferson H. G. Guano .....      | Lann & Carter Hdw. Co., Aberdeen....    |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| <b>LAUREL OIL &amp; FERTILIZER CO.,</b><br>Laurel, Miss. |                                  |                                         |
| 13474                                                    | H. G. Acid Phosphate 16%.....    | Winston Co. Union Wse., Louisville....  |
| 14658                                                    | H. G. Acid Phosphate 16%.....    | G. B. Hall, West Columbia.....          |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| 12904                                                    | H. G. Acid Phosphate 14%.....    | J. F. Wilson, Philadelphia.....         |
| 12905                                                    | H. G. Acid Phosphate 14%.....    | Laurel Oil & Fert. Co., Laurel.....     |
| 13020                                                    | H. G. Acid Phosphate 14%.....    | W. A. Gunn, Noxapater.....              |
| 13066                                                    | H. G. Acid Phosphate 14%.....    | Bay Springs Gin & Wse. Co., Bay Sp'gs   |
| 13475                                                    | H. G. Acid Phosphate 14%.....    | J. F. Gibson, New Hebron.....           |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| 13380                                                    | S. G. Cotton Special Guano.....  | Laurel Oil & Fertilizer Co., Laurel.... |
| 13476                                                    | S. G. Cotton Special Guano.....  | Williams Brooke Co., Union.....         |
| 14659                                                    | S. G. Cotton Special Guano.....  | S. G. Armstrong Merc. Co., Oakvale....  |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |
| 13381                                                    | S. G. K. C. Ammoniated Bone..... | S. S. Dale & Sons, Prentiss.....        |
| 14289                                                    | S. G. K. C. Ammoniated Bone..... | Williams & Freeman, Sandersville....    |
| 14660                                                    | S. G. K. C. Ammoniated Bone..... | W. M. Hyde & Co., Poplarville.....      |
|                                                          |                                  | Average.....                            |
|                                                          |                                  | Guarantee.....                          |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value—Per Ton |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                        |
| 14650              | 11.54              | 7.08                    | 3.50                      | 10.58               | .19                 | 1.70               | 1.63             | 21.20                  |
| 14651              | 10.90              | 6.44                    | 4.19                      | 10.63               | .42                 | 1.76               | 1.61             | 21.43                  |
| 14652              | 11.53              | 7.86                    | 2.93                      | 10.79               | .11                 | 1.74               | 1.76             | 21.81                  |
| 14653              | 11.50              | 7.37                    | 2.97                      | 10.34               | .19                 | 1.74               | 1.79             | 21.30                  |
| 13937              | 11.52              | 7.18                    | 2.19                      | 9.37                | 1.44                | 1.95               | 1.84             | 21.15                  |
| 13938              | 11.50              | 7.00                    | 2.03                      | 9.03                | 1.23                | 1.89               | 1.93             | 20.60                  |
| 13939              | 11.97              | 8.43                    | 1.75                      | 10.18               | .59                 | 1.83               | 1.74             | 21.56                  |
| 13940              | 12.00              | 8.43                    | 1.93                      | 10.36               | .51                 | 1.75               | 1.91             | 21.59                  |
|                    | <b>12.17</b>       | <b>7.86</b>             | <b>2.55</b>               | <b>10.41</b>        | <b>.55</b>          | <b>1.79</b>        | <b>1.85</b>      | <b>21.70</b>           |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.65               | 1.80             | 19.96                  |
| 13065              | 3.80               |                         |                           |                     |                     |                    | 12.80            | 12.80                  |
| 13379              | 4.08               |                         |                           |                     |                     |                    | 13.47            | 13.47                  |
|                    | <b>3.94</b>        |                         |                           |                     |                     |                    | <b>13.14</b>     | <b>13.14</b>           |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                  |
| 14654              | 15.94              | 12.95                   | 3.62                      | 16.57               | .17                 |                    |                  | 17.87                  |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                  |
| 14655              | 11.02              | 7.91                    | 2.47                      | 10.38               | 1.33                | 1.64               | 1.85             | 21.02                  |
| 14656              | 14.01              | 8.06                    | 2.60                      | 10.66               | 1.02                | 1.66               | 1.49             | 21.08                  |
| 14657              | 13.67              | 8.62                    | 2.09                      | 10.71               | 1.03                | 1.70               | 1.52             | 21.39                  |
|                    | <b>12.90</b>       | <b>8.20</b>             | <b>2.38</b>               | <b>10.58</b>        | <b>1.12</b>         | <b>1.67</b>        | <b>1.62</b>      | <b>21.17</b>           |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.71                  |
| 13474              | 15.45              | 14.35                   | 2.46                      | 16.81               | .65                 |                    |                  | 18.25                  |
| 14658              | 12.54              | 14.02                   | 2.71                      | 16.73               | .64                 |                    |                  | 18.13                  |
|                    | <b>14.00</b>       | <b>14.19</b>            | <b>2.58</b>               | <b>16.77</b>        | <b>.64</b>          |                    |                  | <b>18.19</b>           |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                  |
| 12904              | 13.93              | 10.94                   | 3.68                      | 14.62               | 1.79                |                    |                  | 15.71                  |
| 12905              | 14.17              | 11.45                   | 3.02                      | 14.47               | 1.66                |                    |                  | 15.62                  |
| 13020              | 11.23              | 12.46                   | 3.17                      | 15.63               | 1.08                |                    |                  | 16.88                  |
| 13066              | 15.68              | 11.82                   | 3.22                      | 15.04               | 1.20                |                    |                  | 16.22                  |
| 13475              | 14.07              | 10.79                   | 5.19                      | 15.98               | .66                 |                    |                  | 17.06                  |
|                    | <b>13.81</b>       | <b>11.49</b>            | <b>3.66</b>               | <b>15.15</b>        | <b>1.28</b>         |                    |                  | <b>16.30</b>           |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                  |
| 13380              | 11.32              | 7.35                    | 2.94                      | 10.29               | 6.08                | 1.19               | 2.19             | 19.30                  |
| 13476              | 10.87              | 7.27                    | 2.97                      | 10.24               | 6.00                | 1.37               | 2.55             | 20.36                  |
| 14659              | 11.55              | 7.35                    | 4.39                      | 11.74               | 4.86                | 1.00               | 1.97             | 19.87                  |
|                    | <b>11.25</b>       | <b>7.33</b>             | <b>3.43</b>               | <b>10.76</b>        | <b>5.65</b>         | <b>1.19</b>        | <b>2.23</b>      | <b>19.85</b>           |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.00               | 2.00             | 18.05                  |
| 13381              | 12.92              | 7.74                    | 3.50                      | 11.24               | 1.38                | 1.28               | 1.88             | 20.46                  |
| 14289              | 11.02              | 3.93                    | 6.46                      | 10.39               | 1.73                | 1.63               | 1.85             | 20.60                  |
| 14660              | 9.22               | 5.20                    | 4.70                      | 9.90                | 4.49                | 1.84               | 1.63             | 20.86                  |
|                    | <b>11.05</b>       | <b>5.62</b>             | <b>4.89</b>               | <b>10.51</b>        | <b>2.53</b>         | <b>1.58</b>        | <b>1.79</b>      | <b>20.64</b>           |
|                    |                    | 8.00                    | 1.50                      | 9.50                | 2.00                | 1.40               | 1.50             | 18.70                  |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                 | Where and from Whom Collected.             |
|--------------------|-----------------------------------------------------------------|--------------------------------------------|
| 14661              | S. G. Meal and Phosphate .....                                  | G. B. Hall, Columbia.....                  |
| 14662              | S. G. Meal and Phosphate .....                                  | H. P. Gates Merc. Co., Magee.....          |
|                    |                                                                 | Average.....                               |
|                    |                                                                 | Guarantee.....                             |
| 12906              | S. G. Plow Brand .....                                          | Williams Brooks Co., Union.....            |
| 12907              | S. G. Plow Brand .....                                          | J. F. Wilson, Philadelphia.....            |
| 12908              | S. G. Plow Brand .....                                          | Laurel Oil & Fert. Co., Laurel.....        |
| 13021              | S. G. Plow Brand .....                                          | W. A. Gunn, Noxapater.....                 |
| 13067              | S. G. Plow Brand .....                                          | J. H. Eddins, Stringer.....                |
| 13477              | S. G. Plow Brand .....                                          | J. F. Gibson, New Hebron.....              |
| 13478              | S. G. Plow Brand .....                                          | Winston County Union Wse., Louisville..... |
| 14288              | S. G. Plow Brand .....                                          | Williams & Freeman, Sandersville.....      |
| 13941              | S. G. Plow Brand .....                                          | G. B. Hall, Columbia.....                  |
| 13942              | S. G. Plow Brand .....                                          | G. B. Hall, Columbia.....                  |
| 13943              | S. G. Plow Brand .....                                          | H. P. Gates Merc. Co., Magee .....         |
| 13944              | S. G. Plow Brand .....                                          | H. P. Gates Merc. Co., Magee.....          |
|                    |                                                                 | Average.....                               |
|                    |                                                                 | Guarantee.....                             |
|                    | <b>LOTTERHOS &amp; HUBER COMPANY,</b><br>Crystal Springs, Miss. |                                            |
| 12679              | Castor Pomace.....                                              | Lotterhos & Huber Co., Crystal Sp'gs       |
| 14663              | Castor Pomace.....                                              | Lotterhos & Huber Co., Crystal Sp'gs       |
|                    |                                                                 | Average.....                               |
|                    |                                                                 | Guarantee.....                             |
|                    | <b>MARBACH &amp; EAGAN,</b><br>Crystal Springs, Miss.           |                                            |
| 12680              | Bat Guano .....                                                 | Lotterhos & Huber Co., Crystal Sp'gs       |
|                    |                                                                 | Guarantee.....                             |
|                    | <b>MERIDIAN FERT. FACTORY,</b><br>Meridian, Miss.               |                                            |
| 12909              | H. G. Meridian Southern Acid<br>Phosphate.....                  | Mars Bros., Philadelphia.....              |
| 12910              | H. G. Meridian Southern Acid<br>Phosphate.....                  | Meridian Fert. Factory, Meridian.....      |
| 13069              | H. G. Meridian Southern Acid<br>Phosphate.....                  | Lucedale Com. Co., Lucedale.....           |
| 13479              | H. G. Meridian Southern Acid<br>Phosphate.....                  | G. Lowenberg, McCool.....                  |
| 13480              | H. G. Meridian Southern Acid<br>Phosphate.....                  | Max Kahn, Gloster.....                     |
| 14664              | H. G. Meridian Southern Acid<br>Phosphate.....                  | W. B. Richardson, Newton.....              |
| 14665              | H. G. Meridian Southern Acid<br>Phosphate.....                  | Parker Bros. & Co., Sandersville.....      |
|                    |                                                                 | Average.....                               |
|                    |                                                                 | Guarantee.....                             |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid         |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14661              | 11.57              | 8.28                    | 2.85                      | 11.13               | 2.33                | 1.69               | .52              | 20.77                   |
| 14662              | 11.25              | 8.19                    | 3.04                      | 11.23               | 1.98                | 1.77               | .72              | 21.41                   |
|                    | <b>11.41</b>       | <b>8.24</b>             | <b>2.94</b>               | <b>11.18</b>        | <b>2.15</b>         | <b>1.73</b>        | <b>.62</b>       | <b>21.09</b>            |
|                    |                    | <i>7.50</i>             | <i>2.00</i>               | <i>9.50</i>         | <i>2.00</i>         | <i>2.00</i>        | <i>.50</i>       | <i>20.20</i>            |
| 12906              | 15.10              | 8.93                    | 2.74                      | 11.67               | 1.34                | 1.51               | 1.48             | 21.63                   |
| 12907              | 14.33              | 8.36                    | 2.51                      | 10.87               | 1.34                | 1.90               | 1.64             | 22.51                   |
| 12908              | 13.33              | 8.87                    | 2.93                      | 11.80               | 1.91                | 1.71               | 1.85             | 22.98                   |
| 13021              | 12.43              | 7.78                    | 2.83                      | 10.61               | 1.35                | 1.98               | 1.68             | 22.54                   |
| 13067              | 14.29              | 8.23                    | 3.16                      | 11.39               | .85                 | 1.72               | 2.03             | 22.69                   |
| 13477              | 14.37              | 8.48                    | 1.97                      | 10.45               | 1.62                | 1.79               | 1.79             | 21.74                   |
| 13478              | 13.70              | 8.16                    | 2.15                      | 10.31               | 1.54                | 1.92               | 1.77             | 22.09                   |
| 14288              | 13.45              | 8.20                    | 3.33                      | 11.53               | .61                 | 1.69               | 1.80             | 22.49                   |
| 13941              | 13.05              | 7.50                    | 2.83                      | 10.33               | 1.81                | 1.69               | 1.73             | 21.03                   |
| 13942              | 12.85              | 7.31                    | 2.63                      | 9.94                | 2.28                | 1.52               | 1.71             | 19.84                   |
| 13943              | 14.97              | 9.12                    | 2.87                      | 11.99               | .70                 | 1.61               | 2.06             | 23.00                   |
| 13944              | 14.92              | 8.98                    | 2.88                      | 11.86               | .83                 | 1.54               | 2.05             | 22.54                   |
|                    | <b>13.90</b>       | <b>8.33</b>             | <b>2.73</b>               | <b>11.06</b>        | <b>1.35</b>         | <b>1.72</b>        | <b>1.80</b>      | <b>22.09</b>            |
|                    |                    | <i>7.50</i>             | <i>2.00</i>               | <i>9.50</i>         | <i>2.00</i>         | <i>1.65</i>        | <i>1.50</i>      | <i>19.71</i>            |
| 12679              | 10.00              |                         |                           |                     | 2.13                | 5.75               | .94              | 26.44                   |
| 14663              | 10.75              |                         |                           |                     | 2.25                | 4.66               | .71              | 21.64                   |
|                    | <b>10.37</b>       |                         |                           |                     | <b>2.19</b>         | <b>5.21</b>        | <b>.82</b>       | <b>24.04</b>            |
|                    |                    |                         |                           |                     | <i>1.50</i>         | <i>4.50</i>        | <i>.50</i>       | <i>20.38</i>            |
| 12680              | 14.95              |                         |                           |                     | 6.95                | 3.91               | .50              | 20.59                   |
|                    |                    |                         |                           |                     | <i>1.50</i>         | <i>4.50</i>        | <i>.50</i>       | <i>20.38</i>            |
| 12909              | 14.33              | 10.49                   | 4.31                      | 14.80               | 1.08                |                    |                  | 15.85                   |
| 12910              | 14.09              | 9.89                    | 5.02                      | 14.91               | 1.08                |                    |                  | 15.90                   |
| 13069              | 13.92              | 6.76                    | 10.50                     | 17.26               | .17                 |                    |                  | 17.94                   |
| 13479              | 14.42              | 14.06                   | 2.75                      | 16.81               | .29                 |                    |                  | 18.22                   |
| 13480              | 14.70              | 12.60                   | 3.15                      | 15.75               | .93                 |                    |                  | 17.01                   |
| 14664              | 14.03              | 11.82                   | 4.73                      | 16.55               | .32                 |                    |                  | 17.73                   |
| 14665              | 13.03              | 9.50                    | 5.96                      | 15.46               | .57                 |                    |                  | 16.41                   |
|                    | <b>14.07</b>       | <b>10.73</b>            | <b>5.20</b>               | <b>15.93</b>        | <b>.63</b>          |                    |                  | <b>17.01</b>            |
|                    |                    | <i>10.00</i>            | <i>4.00</i>               | <i>14.00</i>        | <i>1.00</i>         |                    |                  | <i>15.00</i>            |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.          |
|--------------------|---------------------------------------------------|-----------------------------------------|
| 12854              | H. G. Meridian Union Special Acid Phosphate ..... | Meridian Fertilizer Factory, Meridian   |
| 12855              | H. G. Meridian Union Special Acid Phosphate ..... | T. M. Steele & Sons, Forest.....        |
| 12911              | H. G. Meridian Union Special Acid Phosphate ..... | Hawkins & McRaney Co., Bassfield....    |
| 12912              | H. G. Meridian Union Special Acid Phosphate ..... | Meridian Fertilizer Factory, Meridian.. |
| 13068              | H. G. Meridian Union Special Acid Phosphate ..... | Bay Springs Gin & Wse. Co., Bay Sp'gs   |
| 13481              | H. G. Meridian Union Special Acid Phosphate ..... | Caraby & Dickson, Mahned.....           |
| 13482              | H. G. Meridian Union Special Acid Phosphate ..... | G. P. McGehee, Gloster.....             |
| 13483              | H. G. Meridian Union Special Acid Phosphate ..... | R. Viener & Co., Natchez.....           |
| 14195              | H. G. Meridian Union Special Acid Phosphate ..... | Holloway & McRaney, Collins.....        |
| 14666              | H. G. Meridian Union Special Acid Phosphate ..... | Weatherbee & Huggins Co., Waynesb'o     |
| 14667              | H. G. Meridian Union Special Acid Phosphate ..... | Holloway & Worthy, Carson.....          |
| 14668              | H. G. Meridian Union Special Acid Phosphate ..... | A. E. Dalrymple & Sons Co., Amory....   |
| 14669              | H. G. Meridian Union Special Acid Phosphate ..... | T. W. Belsher, Steens.....              |
|                    |                                                   | Average.....                            |
|                    |                                                   | Guarantee.....                          |
| 13347              | S. G. Meridian Blood & Bone.....                  | R. Watts & Co., Seminary.....           |
| 13022              | S. G. Meridian Blood & Bone.....                  | J. N. Tabor, Louisville.....            |
| 13070              | S. G. Meridian Blood & Bone.....                  | J. M. Ford, Stringer.....               |
| 13484              | S. G. Meridian Blood & Bone.....                  | J. F. Ruffin Co., New Augusta.....      |
| 13485              | S. G. Meridian Blood & Bone.....                  | Tate-Skelton Co., Goodman.....          |
| 14670              | S. G. Meridian Blood & Bone.....                  | Sumrall Merc. Co., Sumrall.....         |
| 14671              | S. G. Meridian Blood & Bone.....                  | Kennedy & Company, Wiggins.....         |
|                    |                                                   | Average.....                            |
|                    |                                                   | Guarantee.....                          |
| 14672              | S. G. Meridian Ham Bone Guano .....               | McGough Bros., Morton.....              |
| 14673              | S. G. Meridian Ham Bone Guano .....               | C. T. Bonney, Enterprise.....           |
| 14674              | S. G. Meridian Ham Bone Guano .....               | McGough Bros., Morton.....              |
|                    |                                                   | Average.....                            |
|                    |                                                   | Guarantee.....                          |
| 12681              | S. G. Meridian Home Mixture.....                  | Meridian Fert. Factory, Hattiesburg.... |
| 12856              | S. G. Meridian Home Mixture.....                  | T. M. Steele & Sons, Forest.....        |
| 12913              | S. G. Meridian Home Mixture.....                  | Mars Bros , Philadelphia.....           |
| 12914              | S. G. Meridian Home Mixture.....                  | Hawkins & McRaney Co., Bassfield....    |
| 12915              | S. G. Meridian Home Mixture.....                  | Meridian Fertilizer Factory, Meridian   |
| 12954              | S. G. Meridian Home Mixture.....                  | T. B. Gaddis, Morton.....               |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12854              | 13.25              | 11.82                   | 3.39                      | 15.21               | 1.14                |                    |                  | 16.39                   |
| 12855              | 14.18              | 12.26                   | 3.06                      | 15.32               | .85                 |                    |                  | 16.55                   |
| 12911              | 13.19              | 12.68                   | 3.91                      | 16.59               | .18                 |                    |                  | 17.86                   |
| 12912              | 12.59              | 13.09                   | 2.76                      | 15.85               | 1.08                |                    |                  | 17.16                   |
| 13068              | 14.67              | 8.01                    | 9.05                      | 17.06               | .18                 |                    |                  | 17.86                   |
| 13481              | 15.75              | 12.58                   | 3.48                      | 16.06               | .48                 |                    |                  | 17.32                   |
| 13482              | 14.41              | 12.37                   | 3.98                      | 16.35               | .36                 |                    |                  | 17.59                   |
| 13483              | 15.32              | 12.25                   | 3.45                      | 15.70               | .43                 |                    |                  | 16.93                   |
| 14195              | 13.12              | 13.15                   | 4.24                      | 17.39               | .24                 |                    |                  | 18.71                   |
| 14666              | 13.86              | 13.89                   | 3.59                      | 17.48               | .05                 |                    |                  | 18.87                   |
| 14667              | 14.47              | 12.95                   | 3.96                      | 16.91               | .24                 |                    |                  | 18.21                   |
| 14668              | 9.26               | 13.69                   | 3.31                      | 17.00               | .32                 |                    |                  | 18.37                   |
| 14669              | 13.22              | 11.88                   | 4.24                      | 16.12               | .61                 |                    |                  | 17.51                   |
|                    | <b>13.63</b>       | <b>12.36</b>            | <b>4.03</b>               | <b>16.39</b>        | <b>.47</b>          |                    |                  | <b>17.63</b>            |
|                    |                    | <i>13.00</i>            | <i>3.00</i>               | <i>16.00</i>        | <i>1.00</i>         |                    |                  | <i>17.30</i>            |
| 13347              | 8.72               | 6.52                    | 4.76                      | 11.28               | .71                 | 1.46               | 1.53             | 20.80                   |
| 13022              | 10.51              | 9.83                    | 2.96                      | 12.79               | .31                 | 1.54               | 1.96             | 23.56                   |
| 13070              | 11.26              | 6.70                    | 4.92                      | 11.62               | .41                 | 1.21               | 1.83             | 20.42                   |
| 13484              | 13.54              | 8.41                    | 2.95                      | 11.36               | .47                 | 1.42               | 1.38             | 20.75                   |
| 13485              | 13.55              | 8.56                    | 2.78                      | 11.34               | .29                 | 1.58               | 1.50             | 21.55                   |
| 14670              | 11.96              | 5.60                    | 5.01                      | 10.61               | .37                 | 1.59               | 1.23             | 20.22                   |
| 14671              | 11.85              | 7.33                    | 4.50                      | 11.83               | 1.62                | 1.63               | 1.65             | 22.32                   |
|                    | <b>11.63</b>       | <b>7.57</b>             | <b>3.98</b>               | <b>11.55</b>        | <b>.59</b>          | <b>1.49</b>        | <b>1.58</b>      | <b>21.37</b>            |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>        | <i>1.50</i>      | <i>20.21</i>            |
| 14672              | 15.05              | 9.31                    | 4.02                      | 13.33               | .43                 | 1.42               | 1.61             | 23.24                   |
| 14673              | 16.42              | 9.44                    | 3.63                      | 13.07               | .23                 | 1.52               | 1.36             | 23.14                   |
| 14674              | 15.39              | 8.60                    | 3.44                      | 12.04               | 1.14                | 1.54               | 1.45             | 22.10                   |
|                    | <b>15.62</b>       | <b>9.12</b>             | <b>3.69</b>               | <b>12.81</b>        | <b>.60</b>          | <b>1.49</b>        | <b>1.48</b>      | <b>22.83</b>            |
|                    |                    | <i>6.00</i>             | <i>2.00</i>               | <i>8.00</i>         | <i>1.00</i>         | <i>1.65</i>        | <i>2.00</i>      | <i>18.41</i>            |
| 12681              | 14.75              | 9.69                    | 2.41                      | 12.10               | .13                 | 2.00               | 1.61             | 24.39                   |
| 12856              | 15.23              | 7.77                    | 2.78                      | 10.55               | 1.73                | 1.66               | 1.41             | 20.85                   |
| 12913              | 14.23              | 7.76                    | 3.05                      | 10.81               | 1.53                | 1.87               | 1.50             | 22.11                   |
| 12914              | 15.14              | 9.53                    | 2.88                      | 12.41               | .23                 | 1.69               | 1.60             | 23.39                   |
| 12915              | 13.81              | 7.79                    | 3.69                      | 11.48               | .79                 | 1.79               | 1.57             | 22.58                   |
| 12954              | 13.69              | 8.04                    | 2.80                      | 10.84               | .99                 | 1.94               | 1.50             | 22.47                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.   | Where and from Whom Collected.            |
|--------------------|-----------------------------------|-------------------------------------------|
| 12998              | S. G. Meridian Home Mixture...    | Ross Bros. & Summer, Pelahatchie...       |
| 12999              | S. G. Meridian Home Mixture...    | J. L. Wells, Hickory.....                 |
| 13071              | S. G. Meridian Home Mixture...    | Lucedale Com. Co., Lucedale.....          |
| 13072              | S. G. Meridian Home Mixture...    | Bay Springs Gin & Wse. Co., Bay Sp'gs     |
| 13486              | S. G. Meridian Home Mixture...    | Smith, McKennon & Son, Weir.....          |
| 13487              | S. G. Meridian Home Mixture...    | McHenry Merc. Co., McHenry.....           |
| 13488              | S. G. Meridian Home Mixture...    | W. M. McCoy, Poplarville.....             |
| 13489              | S. G. Meridian Home Mixture...    | Loper Merc. Co., Lake.....                |
| 13490              | S. G. Meridian Home Mixture...    | C. H. Stevens, Richton.....               |
| 13491              | S. G. Meridian Home Mixture...    | Tatum & McLain, Gloster.....              |
| 13492              | S. G. Meridian Home Mixture...    | R. Viener & Co., Natchez.....             |
| 13493              | S. G. Meridian Home Mixture...    | J. M. Boyd & Son, Louin.....              |
| 13562              | S. G. Meridian Home Mixture...    | Weatherbee & Huggins Co., Waynesboro      |
| 14676              | S. G. Meridian Home Mixture...    | Clayton-Ellis Co., Heidelberg.....        |
| 14677              | S. G. Meridian Home Mixture...    | Sumrall Merc. Co., Sumrall.....           |
| 14678              | S. G. Meridian Home Mixture...    | John McGrath & Sons, Brookhaven...        |
| 14679              | S. G. Meridian Home Mixture...    | T. M. Ford & Co, Eupora.....              |
| 14680              | S. G. Meridian Home Mixture...    | J. S. Eaton & Bro., Taylorsville.....     |
| 14681              | S. G. Meridian Home Mixture...    | Barnes & Company, Columbia.....           |
| 14682              | S. G. Meridian Home Mixture...    | W. H. Wood, Pontotoc.....                 |
| 14683              | S. G. Meridian Home Mixture...    | W. M. Sheffield, Maben.....               |
| 14684              | S. G. Meridian Home Mixture...    | A. E. Dalrymple & Sons, Amory.....        |
| 14685              | S. G. Meridian Home Mixture...    | W. W. Harris & Co., Iuka.....             |
| 14686              | S. G. Meridian Home Mixture...    | Phillips, Reinhart, Taylor Co., B'onev'le |
| 14687              | S. G. Meridian Home Mixture...    | Bonds, Youngblood & Co., Baldwyn...       |
| 14688              | S. G. Meridian Home Mixture...    | Mars Bros., Philadelphia.....             |
| 14689              | S. G. Meridian Home Mixture...    | J. H. Williams & Sons, Prentiss.....      |
| 14690              | S. G. Meridian Home Mixture...    | Parker Bros., Sandersville.....           |
| 13945              | S. G. Meridian Home Mixture...    | F. L. Riley Merc. Co., Newhebron.....     |
| 13946              | S. G. Meridian Home Mixture...    | F. L. Riley Merc. Co., Newhebron.....     |
| 13973              | S. G. Meridian Home Mixture...    | W. C. Ellis & Co., Magee.....             |
| 13974              | S. G. Meridian Home Mixture...    | W. C. Ellis & Co., Magee.....             |
|                    |                                   | Average.....                              |
|                    |                                   | Guarantee.....                            |
| 13382              | S. G. Meridian Meal Mixture ..... | Holloway & McRaney, Collins.....          |
| 14197              | S. G. Meridian Meal Mixture.....  | Holloway & McRaney, Collins.....          |
| 14692              | S. G. Meridian Meal Mixture.....  | Hawkins & McRaney, Bassfield.....         |
|                    |                                   | Average.....                              |
|                    |                                   | Guarantee.....                            |
| 14675              | H. G. Muriate of Potash .....     | Meridian Fert. Factory Wse., Meridian     |
|                    |                                   | Guarantee.....                            |
| 12857              | H. G. Nitrate of Soda.....        | Meridian Fertilizer Factory, Meridian     |
|                    |                                   | Guarantee.....                            |
| 13023              | H. G. Meridian Veg Grower ...     | J. N. Tabor, Louisville.....              |
| 13494              | H. G. Meridian Vege Grower ..     | R. Viener & Co., Natchez.....             |
|                    |                                   | Average.....                              |
|                    |                                   | Guarantee.....                            |
| 13563              | S. G. Meridian German Kainit ..   | Weatherbee-Huggins Co., Waynesboro        |
| 14691              | S. G. Meridian German Kainit ..   | O. Hopkins, Hickory.....                  |
|                    |                                   | Average.....                              |
|                    |                                   | Guarantee.....                            |





TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                        |
|--------------------|---------------------------------------------------------|-------------------------------------------------------|
|                    | <b>DAHNKE-WALKER MILLING CO.,</b><br>Union City, Tenn.  |                                                       |
| 14034              | Wheat Bran .....                                        | F. Giardina, Greenville.....                          |
| 14506              | Wheat Bran .....                                        | Merchants Grocery Co., Brookhaven.<br>Guarantee.....  |
|                    | <b>DAVIS &amp; ANDREWS COMPANY,</b><br>Memphis, Tenn.   |                                                       |
| 14035              | Wheat Shorts.....                                       | J. Niles Boyd, Kosciusko.....<br>Guarantee.....       |
| 14507              | Wheat Bran .....                                        | W. T. Ware, Aberdeen.....<br>Guarantee.....           |
|                    | <b>J. B. EDGAR GRAIN COMPANY,</b><br>Memphis, Tenn.     |                                                       |
| 14038              | Ceralfa Stock Feed .....                                | Planters Supply Co., Greenwood.....                   |
| 14039              | Ceralfa Stock Feed .....                                | Krecker & Moore, Winona.....                          |
| 14040              | Ceralfa Stock Feed .....                                | W. H. Pritchard & Co., Natchez.....                   |
| 14041              | Ceralfa Stock Feed .....                                | R. L. Crook & Co., Vicksburg.....                     |
| 14042              | Ceralfa Stock Feed .....                                | J. C. McClinton, Newton .....                         |
| 14509              | Ceralfa Stock Feed .....                                | R. L. Crook & Co., Vicksburg.....                     |
| 14510              | Ceralfa Stock Feed .....                                | W. H. Pritchard & Co., Natchez.<br>Guarantee.....     |
|                    | <b>EMPIRE RICE MILLING COMPANY.</b><br>New Orleans, La. |                                                       |
| 14043              | Rice Bran .....                                         | C. Atkinson's Sons Co., Summit.....<br>Guarantee..... |
|                    | <b>EDWARDSVILLE MILLING CO.,</b><br>Edwardsville, Ill.  |                                                       |
| 14511              | Wheat Bran .....                                        | A. D. Smith & Co., Indianola.....<br>Guarantee.....   |
|                    | <b>M. FORCHHEIMER &amp; COMPANY,</b><br>Mobile, Ala.    |                                                       |
| 14512              | Wheat Bran .....                                        | McInnis Bros., Moss Point.....<br>Guarantee.....      |
|                    | <b>FREEBURG MILLING COMPANY,</b><br>Freeburg, Ill.      |                                                       |
| 14513              | Wheat Middlings .....                                   | T. E. Winn, Laurel.....<br>Guarantee.....             |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14034              | 10.67              | 6.46          | 6.24                | 13.50                   | 56.00                   | 7.13                  |
| 14506              | 8.68               | 6.18          | 4.91                | 14.13                   | 58.70                   | 7.40                  |
|                    |                    |               | 3.95                | 14.00                   | 55.00                   | 10.50                 |
| 14035              | 9.90               | 4.75          | 5.24                | 20.13                   | 55.23                   | 4.75                  |
|                    |                    |               | 3.50                | 10.00                   | 54.00                   | 10.50                 |
| 14507              | 8.12               | 6.65          | 5.66                | 15.69                   | 53.11                   | 10.77                 |
|                    |                    |               | 3.50                | 10.00                   | 54.00                   | 10.50                 |
| 14038              | 12.83              | 5.84          | 5.21                | 12.13                   | 59.84                   | 4.15                  |
| 14039              | 11.32              | 6.75          | 5.26                | 13.94                   | 56.23                   | 6.50                  |
| 14040              | 11.00              | 4.29          | 4.85                | 13.56                   | 60.08                   | 6.22                  |
| 14041              | 8.17               | 6.02          | 3.76                | 13.38                   | 62.74                   | 5.93                  |
| 14042              | 10.17              | 6.45          | 4.53                | 13.63                   | 58.87                   | 6.35                  |
| 14509              | 8.77               | 5.83          | 3.66                | 12.81                   | 60.50                   | 8.43                  |
| 14510              | 9.86               | 7.50          | 4.07                | 13.31                   | 57.88                   | 7.38                  |
|                    |                    |               | 4.00                | 13.00                   | 55.00                   | 11.50                 |
| 14043              | 9.00               | 9.37          | 14.51               | 13.19                   | 44.39                   | 9.54                  |
|                    |                    |               | 10.85               | 12.69                   | 49.35                   | 10.00                 |
| 14511              | 7.10               | 6.60          | 4.47                | 14.50                   | 58.99                   | 8.34                  |
|                    |                    |               | 3.50                | 14.00                   | 54.00                   | 9.05                  |
| 14512              | 8.59               | 6.09          | 5.10                | 14.94                   | 58.03                   | 7.25                  |
|                    |                    |               | 3.50                | 14.00                   | 40.00                   | 9.00                  |
| 14513              | 9.73               | 3.85          | 5.29                | 16.56                   | 61.74                   | 2.83                  |
|                    |                    |               | 3.50                | 13.50                   | 55.00                   | 5.00                  |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.                                          |
|--------------------|--------------------------------------------------------------|-------------------------------------------------------------------------|
|                    | <b>NEW ORLEANS ACID &amp; FERT. CO.,</b><br>New Orleans, La. |                                                                         |
| 12955              | H. G. Bull Dog Acid Phosphate 16%.....                       | Osyka Supply Co., Osyka.....                                            |
| 13882              | H. G. Bull Dog Acid Phosphate 16%.....                       | J. M. McGehee & Son, Summit.....                                        |
| 13883              | H. G. Bull Dog Acid Phosphate 16%.....                       | S. Cohn & Sons, Magnolia.....                                           |
| 14292              | H. G. Bull Dog Acid Phosphate 16%.....                       | Williams & Freeman, Sandersville.....<br>Average.....<br>Guarantee..... |
| 14703              | H. G. New Orleans Acid Phosphate 14% .....                   | G. S. Weems, Shubuta.....<br>Guarantee.....                             |
| 12956              | S. G. Black Diamond Acid Phosphate.....                      | Williams & Freeman, Sandersville.....                                   |
| 13442              | S. G. Black Diamond Acid Phosphate.....                      | Gallaspy Bros. & Co., Union .....                                       |
|                    |                                                              | Average.....<br>Guarantee.....                                          |
| 14704              | S. G. Ammoniated R. B. Superphosphate and Potash.....        | T. J. Reddock & Co., Bassfield .....                                    |
|                    |                                                              | Guarantee.....                                                          |
| 13884              | S. G. Blood, Bone & Beef .....                               | Osyka Supply Co., Osyka.....                                            |
| 13885              | S. G. Blood, Bone & Beef .....                               | The Rankin Co., Columbia.....                                           |
| 14290              | S. G. Blood, Bone & Beef .....                               | Williams & Freeman, Sandersville.....                                   |
| 14705              | S. G. Blood, Bone & Beef .....                               | S. Cohn & Sons, Magnolia.....<br>Average.....<br>Guarantee.....         |
| 13886              | H. G. Dissolved Bone & Potash.....                           | O'Connell-Rudder Co., Bassfield.....<br>Guarantee.....                  |
| 14706              | H. G. Economizer .....                                       | Donald Bros., Magee.....<br>Guarantee.....                              |
| 13386              | H. G. Farmers Cornucopia.....                                | J. J. Prince & Co., Shuqualak.....                                      |
| 13887              | H. G. Farmers Cornucopia.....                                | J. M. McGehee & Son, Summit.....                                        |
| 14707              | H. G. Farmers Cornucopia.....                                | Donald Bros., Magee.....<br>Average.....<br>Guarantee.....              |
| 12957              | S. G. Gold Dust.....                                         | Osyka Supply Co., Osyka.....                                            |
| 13888              | S. G. Gold Dust.....                                         | S. Cohn & Sons, Magnolia.....                                           |
| 14708              | S. G. Gold Dust.....                                         | B. B. Davis, Buckatunna.....<br>Average.....<br>Guarantee.....          |
| 13947              | S. G. Goldsmith's Imp Mixt.....                              | Hickman, Son, Butler & Co., Monticello.....                             |
| 13948              | S. G. Goldsmith's Imp Mixt.....                              | Hickman, Son, Butler & Co., Monticello.....                             |
| 13963              | S. G. Goldsmith's Imp Mixt.....                              | W. H. Gallaspy Sons Co., Hickory.....                                   |
| 13964              | S. G. Goldsmith's Imp. Mixt.....                             | W. H. Gallaspy Sons Co., Hickory.....                                   |
| 13965              | S. G. Goldsmith's Imp. Mixt.....                             | Gallaspy Bros. & Co., Union.....                                        |



## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12955              | 11.12              | 14.32                   | 1.41                      | 15.73               | .13                 |                    |                  | 17.16                   |
| 13882              | 13.96              | 13.65                   | 1.55                      | 15.20               | .15                 |                    |                  | 16.57                   |
| 13883              | 12.82              | 14.50                   | 1.12                      | 15.62               | .21                 |                    |                  | 17.07                   |
| 14292              | 13.75              | 13.70                   | 2.38                      | 16.08               | .14                 |                    |                  | 17.45                   |
|                    | <b>12.91</b>       | <b>14.04</b>            | <b>1.61</b>               | <b>15.65</b>        | <b>.14</b>          |                    |                  | <b>17.06</b>            |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                   |
| 14703              | 9.92               | 9.68                    | 3.91                      | 13.59               | .09                 |                    |                  | 14.56                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 12956              | 9.42               | 10.32                   | 1.71                      | 12.03               | .14                 |                    |                  | 13.06                   |
| 13442              | 8.15               | 9.55                    | 2.11                      | 11.66               | .33                 |                    |                  | 12.62                   |
|                    | <b>8.78</b>        | <b>9.93</b>             | <b>1.91</b>               | <b>11.84</b>        | <b>.23</b>          |                    |                  | <b>12.84</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    |                  | 13.00                   |
| 14704              | 10.87              | 7.42                    | 2.12                      | 9.54                | .06                 | 1.40               | 1.36             | 18.55                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 19.11                   |
| 13884              | 13.15              | 8.09                    | 1.39                      | 9.48                | .15                 | 1.53               | 1.47             | 19.21                   |
| 13885              | 12.45              | 7.27                    | 1.91                      | 9.18                | .20                 | 1.34               | 1.42             | 17.94                   |
| 14290              | 12.22              | 7.79                    | 1.86                      | 9.65                | .19                 | 1.57               | 1.74             | 19.81                   |
| 14705              | 11.36              | 7.31                    | 2.10                      | 9.41                | .13                 | 1.79               | 1.63             | 20.32                   |
|                    | <b>12.29</b>       | <b>7.61</b>             | <b>1.82</b>               | <b>9.43</b>         | <b>.17</b>          | <b>1.56</b>        | <b>1.56</b>      | <b>19.32</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 19.11                   |
| 13886              | 11.62              | 9.26                    | 2.47                      | 11.73               | .35                 |                    | 1.75             | 15.58                   |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                |                    | 2.00             | 16.20                   |
| 14706              | 14.25              | 7.53                    | 4.02                      | 11.55               | .26                 | 1.40               | 1.90             | 21.31                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.81                   |
| 13386              | 13.30              | 10.69                   | 1.11                      | 11.80               | .08                 | 2.55               | 2.11             | 27.00                   |
| 13887              | 15.32              | 10.12                   | 1.70                      | 11.82               | .26                 | 2.68               | 2.07             | 27.47                   |
| 14707              | 12.67              | 10.65                   | 2.81                      | 13.46               | .17                 | 1.94               | 1.52             | 25.64                   |
|                    | <b>13.76</b>       | <b>10.49</b>            | <b>1.87</b>               | <b>12.36</b>        | <b>.17</b>          | <b>2.39</b>        | <b>1.90</b>      | <b>26.70</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                | 2.47               | 2.00             | 26.70                   |
| 12957              | 7.16               | 9.50                    | .99                       | 10.49               | .11                 | 1.25               | 2.43             | 20.23                   |
| 13888              | 12.85              | 7.68                    | 1.40                      | 9.08                | .18                 | 1.69               | 1.65             | 19.59                   |
| 14708              | 11.22              | 5.96                    | 3.72                      | 9.68                | .41                 | 1.94               | 1.50             | 20.99                   |
|                    | <b>10.41</b>       | <b>7.71</b>             | <b>2.04</b>               | <b>9.75</b>         | <b>.23</b>          | <b>1.63</b>        | <b>1.86</b>      | <b>20.27</b>            |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 19.11                   |
| 13947              | 11.35              | 7.31                    | 1.52                      | 8.83                | .13                 | 2.06               | 1.40             | 20.60                   |
| 13948              | 11.32              | 7.21                    | 1.41                      | 8.62                | .13                 | 1.85               | 1.37             | 19.44                   |
| 13963              | 16.87              | 7.28                    | 3.12                      | 10.40               | .47                 | 1.96               | 1.62             | 22.12                   |
| 13964              | 17.10              | 6.83                    | 3.12                      | 9.95                | .52                 | 2.04               | 1.72             | 22.02                   |
| 13965              | 12.85              | 8.58                    | 1.53                      | 10.11               | .65                 | 1.78               | 1.11             | 20.65                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                       |
|--------------------|----------------------------------------------------------|------------------------------------------------------|
| 13966              | S. G. Goldsmith's Imp. Mixt.....                         | Gallaspy Bros. & Co., Union.....                     |
| 13975              | S. G. Goldsmith's Imp. Mixt.....                         | Donald Bros., Magee.....                             |
| 13976              | S. G. Goldsmith's Imp. Mixt.....                         | Donald Bros., Magee.....                             |
| 14388              | S. G. Goldsmith's Imp. Mixt.....                         | W. H. Gallaspy Sons Co., Hickory.....                |
| 14389              | S. G. Goldsmith's Imp. Mixt.....                         | W. H. Gallaspy Sons Co., Hickory.....                |
| 12858              | S. G. Goldsmith's Imp. Mixt.....                         | Summer Bros., Morton.....                            |
| 13890              | S. G. Goldsmith's Imp. Mixt.....                         | W. C. Ellis & Co., Magee.....                        |
| 13889              | S. G. Goldsmith's Imp. Mixt.....                         | J. M. McGehee & Son, Summit.....                     |
| 14291              | S. G. Goldsmith's Imp. Mixt.....                         | Williams & Freeman, Sandersville.....                |
|                    |                                                          | Average.....                                         |
|                    |                                                          | Guarantee.....                                       |
| 12958              | H. G. Muriate of Potash .....                            | Williams & Freeman, Sandersville.....                |
|                    |                                                          | Guarantee.....                                       |
| 12859              | H. G. Vegetable Grower.....                              | A. L. Hutchinson, Crystal Springs.....               |
|                    |                                                          | Guarantee .....                                      |
|                    | <b>NEWTON OIL &amp; M'F'G. COMPANY,</b><br>Newton, Miss. |                                                      |
| 12860              | H. G. Acid Phosphate 16%.....                            | Farmers Union Warehouse Co., Forest.....             |
| 13499              | H. G. Acid Phosphate 16%.....                            | Farmers Union Warehouse Co., Forest.....             |
| 14709              | H. G. Acid Phosphate 16%.....                            | F. L. White, Philadelphia.....                       |
| 14710              | H. G. Acid Phosphate 16%.....                            | J. H. Foy, Ethel.....                                |
| 14711              | H. G. Acid Phosphate 16%.....                            | T. B. Gaddis, Morton.....                            |
|                    |                                                          | Average.....                                         |
|                    |                                                          | Guarantee.....                                       |
| 13000              | H. G. Acid Phosphate 14%.....                            | S. S. Myers, Pelahatchie.....                        |
|                    |                                                          | Guarantee.....                                       |
| 13967              | S. G. Banner C. & C. Brand .....                         | Z. T. Harrison, Hickory.....                         |
| 13968              | S. G. Banner C. & C. Brand .....                         | Z. T. Harrison, Hickory.....                         |
| 14390              | S. G. Banner C. & C. Brand .....                         | T. B. Gaddis, Morton.....                            |
| 14391              | S. G. Banner C. & C. Brand .....                         | T. B. Gaddis, Morton.....                            |
| 12861              | S. G. Banner C. & C. Brand .....                         | Farmers Union Wse. Co., Forest.....                  |
| 13500              | S. G. Banner C. & C. Brand .....                         | J. H. Foy, Ethel.....                                |
| 13501              | S. G. Banner C. & C. Brand .....                         | F. L. White, Philadelphia.....                       |
| 14712              | S. G. Banner C. & C. Brand .....                         | Farmers Warehouse Co., Pontotoc.....                 |
|                    |                                                          | Average.....                                         |
|                    |                                                          | Guarantee.....                                       |
| 13073              | H. G. Farmers Special Mixture.....                       | Newton Oil & M'f'g. Co., Newton.....                 |
|                    |                                                          | Guarantee.....                                       |
| 13074              | S. G. Pine Land Guano .....                              | Bay Springs Gin & Warehouse Co.,<br>Bay Springs..... |
| 13502              | S. G. Pine Land Guano .....                              | T. B. Gaddis, Morton.....                            |
| 13503              | S. G. Pine Land Guano .....                              | Farmers Union Warehouse Co., Forest.....             |
| 13504              | S. G. Pine Land Guano .....                              | Bay Springs Gin & Wse Co., Bay Sp'gs.....            |
| 14713              | S. G. Pine Land Guano.....                               | F. L. White, Philadelphia.....                       |
|                    |                                                          | Average.....                                         |
|                    |                                                          | Guarantee.....                                       |
| 13001              | S. G. German Kainit.....                                 | S. S. Myers, Pelahatchie.....                        |
|                    |                                                          | Guarantee .....                                      |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                    | Name of Brand and Manufacturer.                  | Where and from Whom Collected.                                        |
|-------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------|
| <b>NITRATE AGENCIES COMPANY,<br/>New Orleans, La.</b> |                                                  |                                                                       |
| 13387                                                 | H. G. Muriate of Potash .....                    | Farmers Warehouse Co., Ellisville....<br>Guarantee.....               |
| 13388                                                 | H. G. Nitrate of Soda .....                      | Farmers Warehouse Co., Ellisville....                                 |
| 14714                                                 | H. G. Nitrate of Soda .....                      | O. Hopkins, Hickory.....<br>Average.....<br>Guarantee.....            |
| <b>PIONEER FERTILIZER COMPANY,<br/>Florence, Ala.</b> |                                                  |                                                                       |
| 13024                                                 | Pioneer H. G. Special Acid<br>Phosphate 16%..... | Farmers Warehouse Co., Mathiston....                                  |
| 13075                                                 | Pioneer H. G. Special Acid<br>Phosphate 16%..... | Farmers Warehouse Co., Neshoba.....                                   |
| 13435                                                 | Pioneer H. G. Special Acid<br>Phosphate 16%..... | Farmers Warehouse Co., Goodman....                                    |
| 13828                                                 | Pioneer H. G. Special Acid<br>Phosphate 16%..... | Farmers Warehouse Co., Neshoba.....                                   |
| 13845                                                 | Pioneer H. G. Special Acid<br>Phosphate 16%..... | Farmers Union Warehouse Co., Newton<br>Average.....<br>Guarantee..... |
| 14715                                                 | Pioneer H. G. Acid Phos. 14%.....                | Farmers Warehouse Co., Ellisville....<br>Guarantee.....               |
| 12960                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Union Wse. Co., Amory*....                                    |
| 13327                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Union Wse. Co., Amory*....                                    |
| 13401                                                 | Pioneer S. G. Blood & Bone.....                  | M. L. Hand, Lawrence.....                                             |
| 13437                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Warehouse Co., Goodman....                                    |
| 13436                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Union Wse. Co., Newton †....                                  |
| 13846                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Union Wse. Co., Newton †....                                  |
| 13829                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Warehouse Co., Neshoba....                                    |
| 14580                                                 | Pioneer S. G. Blood & Bone.....                  | Farmers Union Warehouse Co., Newton<br>Average.....<br>Guarantee..... |
| 12971                                                 | O. G. Pioneer Cotton Grower .....                | Farmers Warehouse Co., Ellisville....                                 |
| 14716                                                 | O. G. Pioneer Cotton Grower .....                | J. L. Topp, Baldwin.....<br>Average.....<br>Guarantee.....            |
| 13439                                                 | Pioneer H. G. Cotton Special .....               | Farmers Warehouse Co., Goodman....                                    |
| 14717                                                 | Pioneer H. G. Cotton Special.....                | Farmers Warehouse Co., Pontotoc....<br>Average.....<br>Guarantee..... |
| 13076                                                 | Pioneer S. G. Formula.....                       | Farmers Warehouse Co., Neshoba....                                    |
| 14718                                                 | Pioneer S. G. Formula.....                       | Farmers Warehouse Co., Neshoba....<br>Average.....<br>Guarantee.....  |

\* Samples Nos. 12960 and 13327 were taken from the same shipment.

† Samples Nos. 13436 and 13846 were taken from the same shipment.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13387              | 2.60               |                         |                           |                     |                     |                    | 50.40            | 50.40                   |
| 13388              | 1.96               |                         |                           |                     |                     | 15.02              | 50.00            | 50.00                   |
| 14714              | 1.70               |                         |                           |                     |                     | 15.38              |                  | 63.84                   |
|                    | <b>1.83</b>        |                         |                           |                     |                     | <b>15.20</b>       |                  | 65.37                   |
|                    |                    |                         |                           |                     |                     | 15.00              |                  | <b>64.60</b>            |
|                    |                    |                         |                           |                     |                     |                    |                  | 63.75                   |
| 13024              | 14.44              | 11.23                   | 3.83                      | 15.06               | 1.58                |                    |                  | 16.18                   |
| 13075              | 14.94              | 10.55                   | 2.44                      | 12.99               | 3.35                |                    |                  | 14.05                   |
| 13435              | 14.37              | 12.53                   | 3.24                      | 15.77               | .93                 |                    |                  | 17.02                   |
| 13828              | 13.39              | 12.88                   | 3.57                      | 16.45               | .76                 |                    |                  | 17.74                   |
| 13845              | 15.05              | 11.54                   | 3.31                      | 14.85               | 1.80                |                    |                  | 16.00                   |
|                    | <b>14.44</b>       | <b>11.75</b>            | <b>3.28</b>               | <b>15.03</b>        | <b>1.68</b>         |                    |                  | <b>16.20</b>            |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 17.20                   |
| 14715              | 16.10              | 11.21                   | 3.74                      | 14.95               | 1.24                |                    |                  | 16.07                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 12960              | 12.18              | 8.84                    | 3.67                      | 12.51               | 2.33                | .56                | 2.34             | 19.37                   |
| 13327              | 10.95              | 8.66                    | 4.73                      | 13.39               | 1.43                | .69                | 2.30             | 20.83                   |
| 13401              | 11.42              | 9.38                    | 2.68                      | 12.06               | .87                 | 1.55               | 1.47             | 22.26                   |
| 13437              | 11.37              | 9.72                    | 3.55                      | 13.27               | 1.45                | 1.01               | .93              | 20.79                   |
| 13436              | 12.02              | 9.63                    | 3.08                      | 12.71               | .88                 | 1.26               | 1.47             | 22.77                   |
| 13846              | 11.25              | 9.31                    | 2.61                      | 11.92               | 1.19                | 1.38               | 1.90             | 21.81                   |
| 13829              | 12.20              | 9.33                    | 2.87                      | 12.20               | 1.23                | 1.45               | 1.29             | 21.81                   |
| 14580              | 12.74              | 7.81                    | 3.74                      | 11.55               | 1.05                | 1.66               | 1.58             | 22.12                   |
|                    | <b>11.77</b>       | <b>9.09</b>             | <b>3.36</b>               | <b>12.45</b>        | <b>1.30</b>         | <b>1.20</b>        | <b>1.66</b>      | <b>21.47</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 12971              | 16.11              | 9.49                    | 1.66                      | 11.15               | 2.42                | .70                | 2.16             | 18.35                   |
| 14716              | 13.10              | 7.73                    | 3.40                      | 11.13               | 2.45                | .79                | 2.21             | 18.58                   |
|                    | <b>14.60</b>       | <b>8.61</b>             | <b>2.53</b>               | <b>11.14</b>        | <b>2.43</b>         | <b>.75</b>         | <b>2.18</b>      | <b>18.47</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | .82                | 1.00             | 16.29                   |
| 13439              | 10.77              | 9.06                    | 2.66                      | 11.72               | 1.61                | 1.46               |                  | 20.00                   |
| 14717              | 11.69              | 8.87                    | 3.32                      | 12.19               | 1.07                | 1.34               |                  | 19.99                   |
|                    | <b>11.23</b>       | <b>8.97</b>             | <b>2.99</b>               | <b>11.96</b>        | <b>1.34</b>         | <b>1.40</b>        |                  | <b>20.00</b>            |
|                    |                    | 10.00                   | 2.00                      | 12.00               | 2.00                | 1.65               |                  | 21.21                   |
| 13076              | 14.65              | 10.42                   | 2.63                      | 13.05               | 3.66                |                    | 2.36             | 17.76                   |
| 14718              | 13.90              | 9.02                    | 4.27                      | 13.29               | 3.10                |                    | 1.61             | 17.13                   |
|                    | <b>14.28</b>       | <b>9.72</b>             | <b>3.45</b>               | <b>13.17</b>        | <b>3.38</b>         |                    | <b>1.98</b>      | <b>17.44</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                |                    | 2.00             | 13.80                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                         | Where and from Whom Collected.           |
|--------------------|-------------------------------------------------------------------------|------------------------------------------|
| 13077              | Pioneer S. G. Monarch .....                                             | Farmers Warehouse Co., Neshoba.....      |
| 14719              | Pioneer S. G. Monarch .....                                             | J. L. Topp, Baldwin.....                 |
| 13438              | Pioneer S. G. Monarch .....                                             | Farmers Warehouse Co., Decatur.....      |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 12961              | Pioneer H. G. Special.....                                              | Farmers Union Warehouse Co., Amory.....  |
| 13025              | Pioneer H. G. Special.....                                              | Farmers Warehouse Co., Mathiston.....    |
| 13830              | Pioneer H. G. Special.....                                              | Farmers Warehouse Co., Neshoba.....      |
| 13903              | Pioneer H. G. Special.....                                              | Farmers Warehouse Co., Taylorsville..... |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 13026              | Pioneer S. G. German Kainit....                                         | Farmers Warehouse Co., Mathiston.....    |
| 13440              | Pioneer S. G. German Kainit....                                         | Farmers Warehouse Co., Goodman.....      |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
|                    | <b>PLANTERS FERTILIZER &amp; CHEMICAL COMPANY,<br/>New Orleans, La.</b> |                                          |
| 13078              | Planter's H. G. Acid Phos. 16%.....                                     | Ginn & McDonald Co., Tylertown.....      |
| 13079              | Planter's H. G. Acid Phos. 16%.....                                     | Robinson Merc. Co., Centreville.....     |
| 14720              | Planter's H. G. Acid Phos. 16%.....                                     | Max Priebatsch, Brookhaven.....          |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 13949              | Planter's S. G. Cotton & Corn<br>No. 1 .....                            | The Rankin Co., Columbia.....            |
| 13950              | Planter's S. G. Cotton and Corn<br>No. 1 .....                          | The Rankin Co., Columbia.....            |
| 14721              | Planter's S. G. Cotton and Corn<br>No. 1 .....                          | Ginn-McDonald Co., Tylertown.....        |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 14722              | Planter's S. G. Golden Mixture.....                                     | Robinson Merc. Co., Centreville.....     |
| 14723              | Planter's S. G. Golden Mixture.....                                     | Max Priebatsch, Brookhaven.....          |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 13080              | Planter's S. G. R. B. Superphosphate .....                              | Ginn & McDonald Co., Tylertown.....      |
| 14724              | Planter's S. G. R. B. Superphosphate .....                              | J. W. Simmons & Sons, Osyka.....         |
|                    |                                                                         | Average.....                             |
|                    |                                                                         | Guarantee.....                           |
| 13081              | Planter's H. G. Vege. Fert. ....                                        | Robinson Merc. Co., Centreville.....     |
|                    |                                                                         | Guarantee.....                           |
|                    | <b>PLANTERS OIL MILL &amp; GIN CO.,<br/>Kosciusko, Miss.</b>            |                                          |
| 14192              | H. G. Acid Phosphate 16%.....                                           | O. L. Shaw, Ackerman.....                |
| 14193              | H. G. Acid Phosphate 16%.....                                           | O. L. Shaw, Ackerman.....                |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13077              | 14.19              | 8.75                    | 2.25                      | 11.00               | 2.22                | 1.48               | 1.90             | 21.17                   |
| 14719              | 11.68              | 8.58                    | 4.13                      | 12.71               | 1.96                | 1.67               | 1.75             | 23.69                   |
| 13438              | 12.52              | 8.99                    | 2.99                      | 11.98               | 2.22                | .89                | 1.88             | 19.74                   |
|                    | <b>13.79</b>       | <b>8.77</b>             | <b>3.13</b>               | <b>11.90</b>        | <b>2.13</b>         | <b>1.35</b>        | <b>1.84</b>      | <b>21.53</b>            |
|                    |                    | 6.00                    | 2.00                      | 8.00                | 2.00                | 1.65               | 2.00             | 18.41                   |
| 12961              | 12.17              | 8.38                    | 2.01                      | 10.39               | 2.84                | 1.25               | 2.37             | 19.95                   |
| 13025              | 11.04              | 9.58                    | 2.83                      | 12.41               | 1.75                | 1.07               | 2.68             | 21.84                   |
| 13830              | 11.81              | 9.12                    | 2.82                      | 11.94               | 1.21                | 1.44               | 1.62             | 21.79                   |
| 13903              | 12.70              | 8.83                    | 3.29                      | 12.12               | 1.26                | 2.00               | 1.48             | 24.20                   |
|                    | <b>11.93</b>       | <b>8.98</b>             | <b>2.74</b>               | <b>11.72</b>        | <b>1.76</b>         | <b>1.44</b>        | <b>2.04</b>      | <b>21.95</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 2.00             | 20.81                   |
| 13026              | 4.84               |                         |                           |                     |                     |                    | 12.51            | 12.51                   |
| 13440              | 2.85               |                         |                           |                     |                     |                    | 13.64            | 13.64                   |
|                    | <b>3.84</b>        |                         |                           |                     |                     |                    | <b>13.68</b>     | <b>13.08</b>            |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13078              | 18.94              | 10.15                   | 5.84                      | 15.99               | .83                 |                    |                  | 17.01                   |
| 13079              | 17.82              | 9.87                    | 6.81                      | 16.68               | .47                 |                    |                  | 17.67                   |
| 14720              | 17.01              | 9.21                    | 6.34                      | 15.55               | .71                 |                    |                  | 16.47                   |
|                    | <b>17.92</b>       | <b>9.74</b>             | <b>6.33</b>               | <b>16.07</b>        | <b>.67</b>          |                    |                  | <b>17.05</b>            |
|                    |                    | 12.50                   | 3.50                      | 16.00               | 2.00                |                    |                  | 17.25                   |
| 13949              | 17.20              | 7.18                    | 4.09                      | 11.27               | 1.12                | 1.65               | 2.10             | 22.23                   |
| 13950              | 16.32              | 6.38                    | 4.45                      | 10.83               | .61                 | 1.66               | 1.85             | 21.46                   |
| 14721              | 13.06              | 7.00                    | 3.38                      | 10.38               | .36                 | 1.51               | 1.43             | 19.97                   |
|                    | <b>15.52</b>       | <b>6.85</b>             | <b>3.97</b>               | <b>10.82</b>        | <b>.69</b>          | <b>1.61</b>        | <b>1.79</b>      | <b>21.22</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 2.00                | 1.65               | 1.50             | 19.66                   |
| 14722              | 14.17              | 5.68                    | 3.58                      | 9.26                | .45                 | 1.73               | 2.10             | 20.21                   |
| 14723              | 13.05              | 5.33                    | 3.74                      | 9.07                | .33                 | 1.66               | 1.66             | 19.23                   |
|                    | <b>13.61</b>       | <b>5.51</b>             | <b>3.66</b>               | <b>9.17</b>         | <b>.39</b>          | <b>1.70</b>        | <b>1.88</b>      | <b>19.72</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 2.00                | 1.65               | 1.50             | 19.66                   |
| 13080              | 12.82              | 5.23                    | 5.16                      | 10.39               | .43                 | 1.46               | 1.55             | 19.71                   |
| 14724              | 13.35              | 4.44                    | 4.92                      | 9.36                | .43                 | 1.64               | 1.85             | 19.56                   |
|                    | <b>13.08</b>       | <b>4.84</b>             | <b>5.04</b>               | <b>9.88</b>         | <b>.43</b>          | <b>1.55</b>        | <b>1.70</b>      | <b>19.64</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 2.00                | 1.65               | 1.50             | 19.66                   |
| 13081              | 10.07              | 4.85                    | 3.82                      | 8.67                | .38                 | 2.03               | 3.69             | 22.34                   |
|                    |                    | 5.50                    | 1.50                      | 7.00                | 2.00                | 2.50               | 3.50             | 22.38                   |
| 14192              | 16.62              | 11.19                   | 3.49                      | 14.68               | 1.56                |                    |                  | 15.80                   |
| 14193              | 15.67              | 9.96                    | 4.25                      | 14.21               | 1.58                |                    |                  | 15.21                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                      | Where and from Whom Collected.                  |
|--------------------|------------------------------------------------------|-------------------------------------------------|
| 13598              | H. G. Acid Phosphate 16%.....                        | Coleman Bros., Noxapater.....                   |
| 14725              | H. G. Acid Phosphate 16%.....                        | C. C. Fancher, McCool.....                      |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |
| 13002              | H. G. Acid Phosphate 14%.....                        | Planters Oil Mill & Gin Co., Kosciusko.....     |
| 13505              | H. G. Acid Phosphate 14%.....                        | W. B. Potts & Sons, Kosciusko.....              |
| 13599              | H. G. Acid Phosphate 14%.....                        | Jackson-Wallace Co., Kosciusko.....             |
| 13600              | H. G. Acid Phosphate 14%.....                        | W. B. Potts & Sons, Kosciusko.....              |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |
| 13003              | S. G. Peerless Guano.....                            | W. B. Potts & Sons, Kosciusko.....              |
| 14240              | S. G. Peerless Guano.....                            | O. L. Shaw, Ackerman.....                       |
| 14241              | S. G. Peerless Guano.....                            | J. G. Irving, Weir.....                         |
| 14242              | S. G. Peerless Guano.....                            | G. Lowenberg, McCool.....                       |
| 14243              | S. G. Peerless Guano.....                            | J. B. Triplitt & Son, McCool.....               |
| 14244              | S. G. Peerless Guano.....                            | C. M. Graham, Ethel.....                        |
| 14726              | S. G. Peerless Guano.....                            | Henderson-Molphus Co., Philadelphia.....        |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |
| 13004              | S. G. German Kainit.....                             | Planters Oil Mill & Gin Co., Kosciusko.....     |
|                    | <b>READ PHOSPHATE COMPANY,</b><br>Nashville, Tenn.   | Guarantee.....                                  |
| 13506              | Read's H. G. Special Acid<br>Phosphate.....          | Gallaspy Bros. & Co., Union.....                |
|                    |                                                      | Guarantee.....                                  |
| 14727              | Read's S. G. Blood & Bone<br>No. 1.....              | Baldwyn Merc. Co., Baldwyn.....                 |
| 14728              | Read's S. G. Blood & Bone<br>No. 1.....              | Phillips, Reinhart, Taylor Co., Booneville..... |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |
| 13507              | Read's S. G. Nitro Phospho<br>Potasso.....           | Gallaspy Bros. & Co., Union.....                |
| 14729              | Read's S. G. Nitro Phospho<br>Potasso.....           | H. H. Little Co., Mize.....                     |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |
|                    | <b>REFUGE COTTON OIL COMPANY,</b><br>Columbus, Miss. |                                                 |
| 12962              | H. G. Refuge Acid Phosphate<br>14%.....              | Refuge Cotton Oil Co., Steens.....              |
| 13027              | H. G. Refuge Acid Phosphate<br>14%.....              | J. A. Hickman, Noxapater.....                   |
| 14731              | H. G. Refuge Acid Phosphate<br>14%.....              | J. T. McClure, Shuqualak.....                   |
|                    |                                                      | Average.....                                    |
|                    |                                                      | Guarantee.....                                  |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13598              | 19.60              | 10.70                   | 3.46                      | 14.16               | 1.71                |                    |                  | 15.23                   |
| 14725              | 17.54              | 10.29                   | 4.67                      | 14.96               | .81                 |                    |                  | 15.99                   |
|                    | <b>17.36</b>       | <b>10.53</b>            | <b>3.97</b>               | <b>14.50</b>        | <b>1.41</b>         |                    |                  | <b>15.56</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 13002              | 13.66              | 11.05                   | 1.50                      | 12.55               | .19                 |                    |                  | 13.66                   |
| 13505              | 17.77              | 11.67                   | 2.78                      | 14.45               | 1.77                |                    |                  | 15.62                   |
| 13599              | 13.52              | 12.59                   | 1.19                      | 13.78               | .19                 |                    |                  | 15.04                   |
| 13600              | 13.60              | 12.30                   | 1.67                      | 13.97               | .19                 |                    |                  | 15.20                   |
|                    | <b>14.64</b>       | <b>11.90</b>            | <b>1.79</b>               | <b>13.69</b>        | <b>.58</b>          |                    |                  | <b>14.88</b>            |
|                    |                    | 11.00                   | 3.00                      | 14.00               | 1.00                |                    |                  | 15.10                   |
| 13003              | 15.94              | 7.73                    | 2.99                      | 10.72               | .87                 | 1.53               | 2.04             | 21.11                   |
| 14240              | 12.10              | 8.01                    | 1.20                      | 9.21                | .27                 | 1.60               | 2.22             | 19.95                   |
| 14241              | 13.15              | 6.98                    | 2.70                      | 9.68                | .17                 | 1.60               | 2.01             | 20.16                   |
| 14242              | 12.32              | 8.18                    | 1.38                      | 9.56                | .26                 | 1.54               | 2.33             | 20.21                   |
| 14243              | 13.37              | 7.60                    | 1.42                      | 9.02                | .45                 | 1.45               | 2.14             | 18.98                   |
| 14244              | 12.55              | 8.14                    | 1.32                      | 9.46                | .23                 | 1.46               | 2.09             | 19.52                   |
| 14726              | 11.93              | 6.75                    | 3.16                      | 9.91                | .71                 | 1.93               | 1.71             | 21.49                   |
|                    | <b>13.05</b>       | <b>7.63</b>             | <b>2.02</b>               | <b>9.65</b>         | <b>.42</b>          | <b>1.59</b>        | <b>2.07</b>      | <b>20.20</b>            |
|                    |                    | 8.00                    | 1.50                      | 9.50                | 1.00                | 1.67               | 1.75             | 20.10                   |
| 13004              | 6.20               |                         |                           |                     |                     |                    | 12.97            | 12.97                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13506              | 12.52              | 10.89                   | 4.89                      | 15.78               | .82                 |                    |                  | 16.87                   |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 2.00                |                    |                  | 17.30                   |
| 14727              | 12.33              | 5.80                    | 4.12                      | 9.92                | 1.25                | 1.86               | 1.53             | 20.93                   |
| 14728              | 9.95               | 6.08                    | 4.21                      | 10.29               | 1.11                | 1.69               | 1.62             | 20.73                   |
|                    | <b>11.14</b>       | <b>5.94</b>             | <b>4.16</b>               | <b>10.10</b>        | <b>1.18</b>         | <b>1.78</b>        | <b>1.57</b>      | <b>20.83</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 13507              | 13.97              | 8.32                    | 2.07                      | 10.39               | 3.28                | 1.67               | 1.61             | 20.97                   |
| 14729              | 10.88              | 5.32                    | 4.05                      | 9.37                | 3.81                | 1.88               | 1.85             | 20.68                   |
|                    | <b>12.43</b>       | <b>6.82</b>             | <b>3.06</b>               | <b>9.88</b>         | <b>3.54</b>         | <b>1.78</b>        | <b>1.73</b>      | <b>20.83</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 12962              | 13.56              | 10.78                   | 3.73                      | 14.51               | .59                 |                    |                  | 15.59                   |
| 13027              | 11.99              | 9.45                    | 3.87                      | 13.32               | .51                 |                    |                  | 14.27                   |
| 14731              | 10.60              | 9.77                    | 4.44                      | 14.21               | .28                 |                    |                  | 15.19                   |
|                    | <b>12.05</b>       | <b>10.00</b>            | <b>4.02</b>               | <b>14.02</b>        | <b>.46</b>          |                    |                  | <b>15.02</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.         |
|--------------------|--------------------------------------------------------------|----------------------------------------|
| 12963              | S. G. Columbus Home Made .....                               | Refuge Cotton Oil Co., Columbus.....   |
| 13028              | S. G. Columbus Home Made.....                                | J. W. Gully & Son, Louisville.....     |
| 14732              | S. G. Columbus Home Made .....                               | J. T. McClure, Shuqualak.....          |
| 14733              | S. G. Columbus Home Made.....                                | Hopper Bros., DeKalb.....              |
|                    |                                                              | Average.....                           |
|                    |                                                              | Guarantee.....                         |
| 12916              | S. G. Sandy Land Special.....                                | E. P. Donald & Sons, Philadelphia...   |
| 14734              | S. G. Sandy Land Special.....                                | Taylor Bros., Eupora.....              |
| 14735              | S. G. Sandy Land Special .....                               | J. H. Cleveland, Union.....            |
|                    |                                                              | Average.....                           |
|                    |                                                              | Guarantee.....                         |
|                    | <b>F. S. ROYSTER GUANO CO.,</b><br>Norfolk, Va.              |                                        |
| 14255              | S. G. Farmer's F. S. Royster's<br>Bone.....                  | C. H. Stevens Co., Richton.....        |
| 14736              | S. G. Farmer's F. S. Royster's<br>Bone.....                  | Williams & Freeman, Sandersville.....  |
|                    |                                                              | Average.....                           |
|                    |                                                              | Guarantee.....                         |
|                    | <b>SHUBUTA OIL &amp; M'F'G. COMPANY.</b><br>Shubuta, Miss.   |                                        |
| 12917              | H. G. Shubuta Acid Phosphate.....                            | Shubuta Oil & M'f'g. Co., Shubuta...   |
|                    |                                                              | Guarantee.....                         |
| 13389              | S. G. Shubuta Mixture .....                                  | Shubuta Oil & M'f'g. Co., Shubuta..... |
| 14737              | S. G. Shubuta Mixture.....                                   | Shubuta Oil & M'f'g. Co., Shubuta...   |
|                    |                                                              | Average.....                           |
|                    |                                                              | Guarantee.....                         |
|                    | <b>SOUTHERN COTTON OIL COMPANY.</b><br>Memphis, Tenn.        |                                        |
| 13390              | S. G. Cotton Hustler.....                                    | E. D. Bourland, Amory.....             |
|                    |                                                              | Guarantee.....                         |
|                    | <b>SOUTHERN OIL &amp; FERTILIZER CO..</b><br>Meridian, Miss. |                                        |
| 12862              | Southern's 20th Century H. G.<br>Acid Phosphate .....        | J. L. Long, Meridian.....              |
| 12918              | Southern's 20th Century H. G.<br>Acid Phosphate .....        | Southern Oil & Fert. Co., Meridian...  |
| 12919              | Southern's 20th Century H. G.<br>Acid Phosphate .....        | Philadelphia Merc. Co., Philadelphia   |
| 13560              | Southern's 20th Century H. G.<br>Acid Phosphate .....        | J. L. Long, Meridian.....              |
|                    |                                                              | Average.....                           |
|                    |                                                              | Guarantee.....                         |
| 12863              | S. G. Cotton Grower .....                                    | J. L. Long, Meridian.....              |
| 12864              | S. G. Cotton Grower.....                                     | Winner Klein & Co., Meridian.....      |
| 12920              | S. G. Cotton Grower.....                                     | Philadelphia Merc. Co., Philadelphia   |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12963              | 14.46              | 7.91                    | 2.93                      | 10.84               | .40                 | 1.19               | 1.52             | 19.29                   |
| 13028              | 12.92              | 7.91                    | 2.87                      | 10.78               | .32                 | 1.16               | 1.50             | 19.08                   |
| 14732              | 12.36              | 7.12                    | 2.51                      | 9.63                | .26                 | 1.72               | 1.84             | 20.46                   |
| 14733              | 14.33              | 6.48                    | 3.10                      | 9.58                | .28                 | .61                | 1.34             | 19.37                   |
|                    | <b>13.52</b>       | <b>7.36</b>             | <b>2.85</b>               | <b>10.21</b>        | <b>.31</b>          | <b>1.42</b>        | <b>1.55</b>      | <b>19.55</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 12916              | 7.66               | 5.00                    | 2.06                      | 7.06                | .24                 | 1.72               | 3.80             | 19.38                   |
| 14734              | 12.34              | 6.75                    | 1.89                      | 8.64                | .32                 | 1.29               | 2.46             | 18.12                   |
| 14735              | 12.41              | 6.65                    | 2.26                      | 8.91                | .23                 | 1.38               | 2.35             | 18.68                   |
|                    | <b>10.80</b>       | <b>6.13</b>             | <b>2.07</b>               | <b>8.20</b>         | <b>.26</b>          | <b>1.47</b>        | <b>2.87</b>      | <b>18.73</b>            |
|                    |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | 1.65               | 4.00             | 19.21                   |
| 14255              | 12.02              | 7.54                    | 2.96                      | 10.50               | .52                 | 1.46               | 1.82             | 20.33                   |
| 14736              | 11.10              | 5.71                    | 4.29                      | 10.00               | .97                 | 1.74               | 1.38             | 20.35                   |
|                    | <b>11.56</b>       | <b>6.63</b>             | <b>3.62</b>               | <b>10.25</b>        | <b>.74</b>          | <b>1.60</b>        | <b>1.60</b>      | <b>20.34</b>            |
|                    |                    | 7.50                    | 2.50                      | 10.00               | 1.50                | 1.65               | 1.50             | 20.26                   |
| 12917              | 14.33              | 12.53                   | 3.85                      | 16.38               | .26                 |                    |                  | 17.63                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 1.00                |                    |                  | 15.00                   |
| 13389              | 12.20              | 6.63                    | 3.72                      | 10.35               | .69                 | 1.74               | 1.84             | 21.28                   |
| 14737              | 9.15               | 7.64                    | 2.54                      | 10.18               | 1.62                | 1.84               | 1.99             | 21.77                   |
|                    | <b>10.67</b>       | <b>7.14</b>             | <b>3.13</b>               | <b>10.27</b>        | <b>1.15</b>         | <b>1.79</b>        | <b>1.92</b>      | <b>21.53</b>            |
|                    |                    | 6.00                    | 3.00                      | 9.00                | 1.00                | 1.65               | 1.60             | 19.11                   |
| 13390              | 16.40              | 7.08                    | 2.47                      | 9.55                | 1.48                | 1.50               | 1.57             | 19.16                   |
|                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65               | 2.00             | 18.96                   |
| 12862              | 13.02              | 10.20                   | 3.78                      | 13.98               | .03                 |                    |                  | 15.00                   |
| 12918              | 12.58              | 9.91                    | 4.00                      | 13.91               | .13                 |                    |                  | 14.90                   |
| 12919              | 13.38              | 10.05                   | 3.38                      | 13.43               | .18                 |                    |                  | 14.44                   |
| 13560              | 13.80              | 10.18                   | 3.73                      | 13.91               | .40                 |                    |                  | 14.93                   |
|                    | <b>13.19</b>       | <b>10.09</b>            | <b>3.72</b>               | <b>13.81</b>        | <b>.18</b>          |                    |                  | <b>14.82</b>            |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 12863              | 10.96              | 7.67                    | 2.87                      | 10.54               | .09                 | 1.64               | 1.81             | 21.14                   |
| 12864              | 11.23              | 8.10                    | 3.07                      | 11.17               | .13                 | 1.23               | 1.25             | 19.57                   |
| 12920              | 10.94              | 8.23                    | 3.12                      | 11.35               | .17                 | 1.50               | 1.52             | 21.20                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                                            | Name of Brand and Manufacturer.   | Where and from Whom Collected.        |
|-------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| 12921                                                                         | S. G. Cotton Grower.....          | Southern Oil & Fert. Co., Meridian... |
| 13508                                                                         | S. G. Cotton Grower.....          | Maddox & Montgomery, Weir.....        |
| 13509                                                                         | S. G. Cotton Grower.....          | Philadelphia Merc. Co., Philadelphia  |
| 13555                                                                         | S. G. Cotton Grower.....          | J. H. Abney & Co., Pachuta.....       |
| 13561                                                                         | S. G. Cotton Grower.....          | J. L. Long, Meridian.....             |
| 13808                                                                         | S. G. Cotton Grower.....          | Simmons & Wright, Kewanee.....        |
| 13912                                                                         | S. G. Cotton Grower.....          | J. L. Long, Agent, Meridian.....      |
| 14738                                                                         | S. G. Cotton Grower.....          | Harrison-Nelson Co., Magee.....       |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 13005                                                                         | S. G. Superior Mixture.....       | McGough Bros., Morton.....            |
| 13510                                                                         | S. G. Superior Mixture.....       | McGough Bros., Morton.....            |
| 14739                                                                         | S. G. Superior Mixture.....       | Brandon Merc. Co., Brandon.....       |
| 13969                                                                         | S. G. Superior Mixture.....       | Loper Merc. Co., Lake.....            |
| 13970                                                                         | S. G. Superior Mixture.....       | Loper Merc. Co., Lake.....            |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| <b>STANDARD GUANO &amp; CHEMICAL<br/>M'F'G. COMPANY,<br/>New Orleans, La.</b> |                                   |                                       |
| 12964                                                                         | Stern's H. G. Acid Phos. 16%..... | Parker Bros., Sandersville.....       |
| 13082                                                                         | Stern's H. G. Acid Phos. 16%..... | Lampton Bros. Co., Tylertown.....     |
| 13083                                                                         | Stern's H. G. Acid Phos. 16%..... | Lampton Merc. Co., Magnolia.....      |
| 13511                                                                         | Stern's H. G. Acid Phos. 16%..... | W. M. McCoy, Poplarville.....         |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 12922                                                                         | Stern's H. G. Acid Phos. 14%..... | O'Connell-Rudder Co., Bassfield.....  |
| 13084                                                                         | Stern's H. G. Acid Phos. 14%..... | E. M. Carter, Centreville.....        |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 14740                                                                         | S. G. Blood, Bone & Meat .....    | O'Connell-Rudder Co., Bassfield.....  |
| 14741                                                                         | S. G. Blood, Bone & Meat .....    | Hyman Merc. Co., Summit.....          |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 12965                                                                         | S. G. Boll Weevil Knocker .....   | Gaddis & Slay Co., Magee.....         |
| 14742                                                                         | S. G. Boll Weevil Knocker .....   | Wm. Atkinson, McDonald Co., Wesson    |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 12966                                                                         | S. G. Farmer's Choice.....        | Gaddis & Slay Co., Magee.....         |
| 14743                                                                         | S. G. Farmer's Choice.....        | J. E. Stewart, Nicholson.....         |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |
| 12967                                                                         | S. G. Miss. Home Guano .....      | Ball Merc. Co., Columbia.....         |
| 13085                                                                         | S. G. Miss. Home Guano .....      | E. M. Carter, Centreville.....        |
| 13512                                                                         | S. G. Miss. Home Guano .....      | W. M. Hyde & Co., Poplarville.....    |
| 14744                                                                         | S. G. Miss. Home Guano .....      | Dunigan-Whitaker Co., Laurel.....     |
|                                                                               |                                   | Average.....                          |
|                                                                               |                                   | Guarantee.....                        |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12921              | 11.89              | 8.15                    | 3.17                      | 11.32               | .18                 | 1.47               | 1.29             | 20.80                   |
| 13508              | 11.02              | 7.28                    | 3.09                      | 10.37               | .26                 | 1.93               | 1.26             | 21.60                   |
| 13509              | 11.94              | 7.82                    | 3.11                      | 10.93               | .18                 | 1.37               | 1.56             | 20.19                   |
| 13555              | 11.12              | 7.59                    | 2.75                      | 10.34               | .28                 | 1.58               | 1.80             | 20.65                   |
| 13561              | 11.82              | 7.99                    | 2.52                      | 10.51               | .26                 | 2.02               | 1.64             | 22.59                   |
| 13808              | 10.72              | 7.86                    | 3.30                      | 11.16               | .17                 | 1.70               | 1.90             | 22.19                   |
| 13912              | 13.22              | 8.92                    | 2.47                      | 11.39               | .46                 | 2.36               | 1.00             | 24.45                   |
| 14837              | 11.16              | 7.31                    | 2.74                      | 10.05               | .19                 | 2.35               | 1.74             | 23.51                   |
|                    | <b>11.45</b>       | <b>7.90</b>             | <b>2.93</b>               | <b>10.83</b>        | <b>.22</b>          | <b>1.74</b>        | <b>1.53</b>      | <b>21.63</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 1.00                | 1.65               | 1.00             | 19.71                   |
| 13005              | 12.18              | 8.19                    | 3.14                      | 11.33               | .31                 | 1.57               | 1.08             | 21.03                   |
| 13510              | 11.91              | 7.39                    | 3.19                      | 10.58               | .14                 | 1.63               | 1.59             | 20.89                   |
| 14739              | 11.29              | 7.60                    | 3.15                      | 10.75               | .15                 | 1.72               | 2.09             | 21.99                   |
| 13969              | 13.57              | 9.17                    | 2.21                      | 11.38               | .29                 | 1.72               | .86              | 21.61                   |
| 13970              | 10.70              | 9.16                    | 2.75                      | 11.91               | .14                 | 2.23               | .45              | 23.94                   |
|                    | <b>11.93</b>       | <b>8.30</b>             | <b>2.89</b>               | <b>11.19</b>        | <b>.20</b>          | <b>1.77</b>        | <b>1.22</b>      | <b>21.89</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 1.00                | 1.65               | 1.00             | 19.71                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 12964              | 17.05              | 11.68                   | 2.35                      | 14.03               | 1.83                |                    |                  | 15.20                   |
| 13082              | 16.85              | 15.72                   | 1.00                      | 16.72               | .10                 |                    |                  | 18.29                   |
| 13083              | 16.07              | 14.86                   | 1.72                      | 16.58               | .19                 |                    |                  | 18.07                   |
| 13511              | 16.27              | 13.83                   | 2.23                      | 16.06               | .26                 |                    |                  | 17.44                   |
|                    | <b>16.56</b>       | <b>14.02</b>            | <b>1.83</b>               | <b>15.85</b>        | <b>.57</b>          |                    |                  | <b>17.25</b>            |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 17.40                   |
| 12922              | 18.10              | 13.07                   | 2.92                      | 15.99               | .74                 |                    |                  | 17.30                   |
| 13084              | 17.92              | 12.05                   | 3.95                      | 16.00               | .73                 |                    |                  | 17.21                   |
|                    | <b>18.01</b>       | <b>12.56</b>            | <b>3.44</b>               | <b>16.00</b>        | <b>.74</b>          |                    |                  | <b>17.25</b>            |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |
| 14740              | 13.28              | 8.14                    | 2.39                      | 10.53               | .31                 | 2.41               | 1.64             | 24.28                   |
| 14741              | 10.46              | 8.62                    | 2.54                      | 11.16               | .79                 | 2.12               | 1.77             | 23.92                   |
|                    | <b>11.87</b>       | <b>8.38</b>             | <b>2.46</b>               | <b>10.84</b>        | <b>.55</b>          | <b>2.27</b>        | <b>1.70</b>      | <b>24.10</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.66                   |
| 12965              | 10.76              | 8.56                    | 1.90                      | 10.46               | .47                 | 2.23               |                  | 21.84                   |
| 14742              | 12.55              | 8.62                    | 2.32                      | 10.94               | .55                 | 2.10               |                  | 21.82                   |
|                    | <b>11.65</b>       | <b>8.59</b>             | <b>2.11</b>               | <b>10.70</b>        | <b>.51</b>          | <b>2.17</b>        |                  | <b>21.83</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 1.00                | 1.65               |                  | 18.71                   |
| 12966              | 11.87              | 8.24                    | 1.65                      | 9.89                | .70                 | 2.22               | 2.21             | 23.35                   |
| 14743              | 13.15              | 8.37                    | 3.26                      | 11.63               | .73                 | 1.62               | 1.45             | 21.97                   |
|                    | <b>12.51</b>       | <b>8.30</b>             | <b>2.46</b>               | <b>10.76</b>        | <b>.72</b>          | <b>1.92</b>        | <b>1.83</b>      | <b>22.66</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.66                   |
| 12967              | 11.62              | 8.75                    | 1.78                      | 10.53               | .83                 | 1.87               | 2.24             | 22.65                   |
| 13085              | 11.60              | 9.30                    | 1.48                      | 10.78               | 1.08                | 1.86               | 2.34             | 23.03                   |
| 13512              | 12.56              | 8.52                    | 2.22                      | 10.74               | .33                 | 1.62               | 2.78             | 22.33                   |
| 14744              | 10.63              | 8.51                    | 2.16                      | 10.67               | .51                 | 2.20               | 1.78             | 23.72                   |
|                    | <b>11.60</b>       | <b>8.77</b>             | <b>1.91</b>               | <b>10.68</b>        | <b>.69</b>          | <b>1.89</b>        | <b>2.28</b>      | <b>22.93</b>            |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.66                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                       | Where and from Whom Collected.                                |
|--------------------|-------------------------------------------------------|---------------------------------------------------------------|
| 12923              | H. G. Muriate of Potash .....                         | O'Connell-Rudder Co., Bassfield.....<br>Guarantee.....        |
| 12968              | Stern's S. G. Am. R. B. Superphosphate .....          | S. S. Dale & Sons, Prentiss.....                              |
| 13086              | Stern's S. G. Am. R. B. Superphosphate .....          | Lampton Merc. Co., Magnolia.....                              |
| 13513              | Stern's S. G. Am. R. B. Superphosphate .....          | Simpson Merc. Co., Terry.....                                 |
| 13514              | Stern's S. G. Am. R. B. Superphosphate .....          | C. H. Stevens Co., Richton.....                               |
| 13515              | Stern's S. G. Am. R. B. Superphosphate .....          | J. F. Ruffin Co., New Augusta.....                            |
| 13516              | Stern's S. G. Am. R. B. Superphosphate .....          | Walker-Durr Co., Pinola.....                                  |
| 14745              | Stern's S. G. Am. R. B. Superphosphate .....          | R. F. Everett, Braxton.....<br>Average.....<br>Guarantee..... |
|                    | <b>SWIFT FERTILIZER WORKS,<br/>Atlanta, Ga.</b>       |                                                               |
| 14746              | Swift's H. G. Cot. King Guano..                       | Phil Pointer, Como.....<br>Guarantee.....                     |
| 14747              | Swift's S. G. Red Steer Guano .                       | W. C. Seale, Roxie.....                                       |
| 14748              | Swift's S. G. Red Steer Guano .                       | Burrow & Co., Saltillo.....<br>Average.....<br>Guarantee..... |
|                    | <b>TENNESSEE CHEMICAL CO.,<br/>Nashville, Tenn.</b>   |                                                               |
| 14749              | Ox H. G. Dissolved Bone.....                          | A. M. Lawrence, Caledonia.....                                |
| 14750              | Ox H. G. Dissolved Bone.....                          | W. A. Lyle, Lauderdale.....<br>Average.....<br>Guarantee..... |
| 14751              | Ox S. G. Cotton Guano .....                           | W. A. Lyle, Lauderdale.....<br>Guarantee.....                 |
| 14752              | Ox S. G. Potash Mixture .....                         | W. A. Lyle, Lauderdale.....<br>Guarantee.....                 |
|                    | <b>TENNESSEE VALLEY FERT. CO.,<br/>Florence, Ala.</b> |                                                               |
| 13087              | Tiger H. G. Dissolved Bone<br>14%.....                | J. B. Hughes, Stallo.....<br>Guarantee.....                   |
| 13834              | S. G. King Cotton Grower.....                         | Farmers Warehouse Co., Amory*                                 |
| 13552              | S. G. King Cotton Grower.....                         | Farmers Warehouse Co., Amory*                                 |
| 12969              | S. G. King Cotton Grower.....                         | Farmers Warehouse Co., Ellisville...                          |
| 13088              | S. G. King Cotton Grower.....                         | J. B. Hughes, Stallo.....                                     |

\* Samples Nos. 13834 and 13552 were drawn from same shipment.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 12923              | 2.58               |                         |                           |                     |                     |                    | 52.67<br>45.00   | 52.67<br>45.00          |
| 12968              | 12.30              | 4.30                    | 4.96                      | 9.26                | 1.46                | 2.40               | 1.60             | 22.42                   |
| 13086              | 12.65              | 5.18                    | 4.66                      | 9.84                | 1.22                | 2.08               | 1.57             | 21.75                   |
| 13513              | 12.40              | 6.65                    | 3.23                      | 9.88                | .31                 | 2.69               | 1.77             | 24.74                   |
| 13514              | 13.15              | 6.53                    | 3.28                      | 9.81                | .88                 | 1.92               | 1.66             | 21.26                   |
| 13515              | 11.02              | 7.37                    | 4.44                      | 11.81               | .78                 | 1.32               | 1.92             | 21.26                   |
| 13516              | 13.25              | 8.13                    | 1.17                      | 9.30                | .33                 | 2.70               | 1.66             | 24.18                   |
| 14745              | 11.48              | 8.25                    | 3.65                      | 11.90               | .45                 | 1.81               | 1.62             | 23.23                   |
|                    | 12.32              | 6.63                    | 3.63                      | 10.26               | .78                 | 2.13               | 1.69             | 22.69                   |
|                    |                    | 7.00                    | 2.50                      | 9.50                | 1.00                | 1.65               | 1.50             | 19.66                   |
| 14746              | 9.58               | 4.25                    | 5.93                      | 10.18               | 4.83                | 2.03               | 1.96             | 22.21                   |
|                    |                    | 6.00                    | 3.00                      | 9.00                | 1.50                | 2.47               | 2.00             | 23.00                   |
|                    | 7.12               | 3.24                    | 4.76                      | 8.00                | 10.43               | 1.55               | 1.74             | 17.45                   |
| 14748              | 7.02               | 3.44                    | 5.11                      | 8.55                | 9.50                | 1.28               | 2.36             | 17.55                   |
|                    | 7.07               | 3.34                    | 4.93                      | 8.27                | 9.96                | 1.42               | 2.05             | 17.50                   |
|                    |                    | 5.50                    | 2.50                      | 8.00                | 1.50                | 1.65               | 2.00             | 18.36                   |
| 14749              | 12.56              | 7.53                    | 4.88                      | 12.41               | .98                 |                    |                  | 13.16                   |
| 14750              | 13.92              | 9.90                    | 3.57                      | 13.47               | 1.02                |                    |                  | 14.46                   |
|                    | 13.24              | 8.71                    | 4.23                      | 12.94               | 1.00                |                    |                  | 13.81                   |
|                    |                    | 8.00                    | 6.00                      | 14.00               | 1.00                |                    |                  | 14.80                   |
| 14751              | 9.65               | 6.49                    | 4.71                      | 11.20               | 1.06                | 1.34               | 1.31             | 19.97                   |
|                    |                    | 6.00                    | 4.00                      | 10.00               | 1.00                | 1.65               | 1.00             | 19.61                   |
|                    | 9.34               | 3.83                    | 6.53                      | 10.36               | .40                 |                    | 1.62             | 13.40                   |
|                    |                    | 6.00                    | 4.00                      | 10.00               | 1.00                |                    | 2.00             | 13.60                   |
| 13087              | 14.12              | 10.55                   | 3.10                      | 13.65               | 2.68                |                    |                  | 14.71                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 13834              | 14.55              | 8.79                    | 3.05                      | 11.84               | 1.65                | 1.02               | 1.59             | 19.83                   |
| 13552              | 14.75              | 8.66                    | 2.78                      | 11.44               | 1.65                | .91                | 1.49             | 18.81                   |
| 12969              | 14.99              | 8.98                    | 3.14                      | 12.12               | 1.20                | .92                | 1.53             | 19.67                   |
| 13088              | 10.84              | 8.78                    | 2.53                      | 11.31               | 2.64                | 1.19               | 2.71             | 21.09                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                           |
|--------------------|----------------------------------------------------------|----------------------------------------------------------|
| 14753              | S. G. King Cotton Grower.....                            | Farmers Warehouse Co., Ellisville.....                   |
| 14392              | S. G. King Cotton Grower.....                            | Farmers Warehouse Co., Oxford.....                       |
| 14393              | S. G. King Cotton Grower.....                            | Farmers Warehouse Co., Oxford.....                       |
|                    |                                                          | Average.....                                             |
|                    |                                                          | Guarantee.....                                           |
| 13006              | O. G. Tiger Cotton Grower.....                           | J. B. Hughes, Stallo.....                                |
| 14754              | O. G. Tiger Cotton Grower.....                           | Burrow & Company, Saltillo.....                          |
|                    |                                                          | Average.....                                             |
|                    |                                                          | Guarantee.....                                           |
|                    | <b>THREEFOOT BROS. &amp; COMPANY,</b><br>Meridian, Miss. |                                                          |
| 12865              | Threefoot's H. G. English<br>Acid Phosphate.....         | Threefoot Bros. & Co., Meridian.....                     |
| 13428              | Threefoot's H. G. English<br>Acid Phosphate.....         | Threefoot Bros. & Co., Meridian.....                     |
| 13809              | Threefoot's H. G. English<br>Acid Phosphate.....         | Simmons & Wright, Kewanee.....                           |
| 13847              | Threefoot's H. G. English<br>Acid Phosphate.....         | Threefoot Bros & Co., Meridian.....                      |
| 13878              | Threefoot's H. G. English<br>Acid Phosphate.....         | Rosenbaum & Little, Lauderdale.....                      |
|                    |                                                          | Average.....                                             |
|                    |                                                          | Guarantee.....                                           |
| 13007              | Threefoot's H. G. Improved<br>Mixture.....               | Smythe-Gaddis & Co., Forest.....                         |
| 13429              | Threefoot's H. G. Improved<br>Mixture.....               | Threefoot Bros. & Co., Meridian.....                     |
| 13430              | Threefoot's H. G. Improved<br>Mixture.....               | Threefoot Bros. & Co., Meridian.....                     |
| 14755              | Threefoot's H. G. Improved<br>Mixture.....               | Rosenbaum & Little, Lauderdale.....                      |
|                    |                                                          | Average.....                                             |
|                    |                                                          | Guarantee.....                                           |
|                    | <b>TUPELO FERTILIZER FACTORY,</b><br>Tupelo, Miss.       |                                                          |
| 12970              | H. G. Cotton Belt Acid Phos-<br>phate 16%.....           | Lann & Carter Hdw. Co., Aberdeen....                     |
| 13517              | H. G. Cotton Belt Acid Phos-<br>phate 16%.....           | E. P. Donald & Sons, Philadelphia....                    |
| 13922              | H. G. Cotton Belt Acid Phos-<br>phate 16%.....           | J. D. Gully, Lauderdale.....                             |
|                    |                                                          | Average.....                                             |
|                    |                                                          | Guarantee.....                                           |
| 13029              | H. G. Cotton Belt Acid Phos-<br>phate 14%.....           | Winston Co. Union Wse. Co., Louisville<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14753              | 12.95              | 7.84                    | 3.78                      | 11.62               | .73                 | 1.67               | 1.01             | 21.67                   |
| 14392              | 12.66              | 9.21                    | 3.12                      | 12.33               | 1.53                | 1.65               | 1.39             | 22.89                   |
| 14393              | 13.12              | 9.18                    | 2.96                      | 12.14               | 1.33                | 1.69               | 1.88             | 23.33                   |
|                    | <b>13.41</b>       | <b>8.78</b>             | <b>3.05</b>               | <b>11.83</b>        | <b>1.53</b>         | <b>1.29</b>        | <b>1.66</b>      | <b>21.04</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.00             | 19.81                   |
| 13006              | 12.66              | 9.01                    | 2.30                      | 11.31               | 2.73                | 1.02               | 2.00             | 19.68                   |
| 14754              | 12.52              | 5.75                    | 4.88                      | 10.63               | 2.73                | .81                | 1.93             | 17.64                   |
|                    | <b>12.59</b>       | <b>7.38</b>             | <b>3.59</b>               | <b>10.97</b>        | <b>2.73</b>         | <b>.92</b>         | <b>1.96</b>      | <b>18.66</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | .82                | 1.00             | 16.29                   |
| 12865              | 14.71              | 13.33                   | 1.82                      | 15.15               | .09                 |                    |                  | 16.48                   |
| 13428              | 12.95              | 9.77                    | 4.87                      | 14.64               | 3.64                |                    |                  | 15.62                   |
| 13809              | 11.27              | 14.94                   | 2.78                      | 17.72               | .23                 |                    |                  | 19.21                   |
| 13847              | 12.64              | 13.10                   | 2.90                      | 16.00               | 2.64                |                    |                  | 17.31                   |
| 13878              | 14.80              | 14.48                   | 2.62                      | 17.10               | .50                 |                    |                  | 18.55                   |
|                    | <b>13.27</b>       | <b>13.12</b>            | <b>3.00</b>               | <b>16.12</b>        | <b>1.62</b>         |                    |                  | <b>17.43</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 13007              | 13.14              | 8.56                    | 2.64                      | 11.20               | .60                 | 1.87               | 2.50             | 23.62                   |
| 13429              | 14.42              | 8.00                    | 2.51                      | 10.51               | .83                 | 1.75               | 2.04             | 21.84                   |
| 13430              | 14.30              | 7.88                    | 2.48                      | 10.36               | .88                 | 1.98               | 2.06             | 22.66                   |
| 14755              | 13.78              | 8.81                    | 3.45                      | 12.26               | .24                 | 1.39               | 1.51             | 21.78                   |
|                    | <b>13.91</b>       | <b>8.31</b>             | <b>2.77</b>               | <b>11.08</b>        | <b>.64</b>          | <b>1.75</b>        | <b>2.03</b>      | <b>22.48</b>            |
|                    |                    | 7.50                    | 2.50                      | 10.00               | 1.00                | 1.67               | 2.00             | 20.85                   |
| 12970              | 17.48              | 13.56                   | 2.27                      | 15.83               | .31                 |                    |                  | 17.19                   |
| 13517              | 17.30              | 15.06                   | 1.82                      | 16.88               | .10                 |                    |                  | 18.39                   |
| 13922              | 15.02              | 15.04                   | 1.58                      | 16.62               | .28                 |                    |                  | 18.12                   |
|                    | <b>16.60</b>       | <b>14.55</b>            | <b>1.89</b>               | <b>16.44</b>        | <b>.23</b>          |                    |                  | <b>17.90</b>            |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 17.30                   |
| 13029              | 16.14              | 11.70                   | 2.94                      | 14.64               | 1.10                |                    |                  | 15.81                   |
|                    |                    | 12.00                   | 2.00                      | 14.00               | 2.00                |                    |                  | 15.20                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                            | Name of Brand and Manufacturer.      | Where and from Whom Collected.                 |
|---------------------------------------------------------------|--------------------------------------|------------------------------------------------|
| 14756                                                         | S. G. Cotton Belt Blood & Bone ..... | Asa W. Allen, Tupelo.....                      |
| 14757                                                         | S. G. Cotton Belt Blood & Bone ..... | J. R. Clayton, Guntown.....                    |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 13971                                                         | S. G. Cotton Belt Fertilizer .....   | E. P. Donald & Sons, Philadelphia.....         |
| 13972                                                         | S. G. Cotton Belt Fertilizer .....   | E. P. Donald & Sons, Philadelphia.....         |
| 13030                                                         | S. G. Cotton Belt Fertilizer .....   | Winston Co. Union Wse. Co., Louisville.....    |
| 13518                                                         | S. G. Cotton Belt Fertilizer .....   | Winston Co. Union Wse. Co., Louisville.....    |
| 13519                                                         | S. G. Cotton Belt Fertilizer .....   | E. P. Donald & Sons, Philadelphia.....         |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 14758                                                         | S. G. Levi Phillips Mixture .....    | Phillips Reinhart, Taylor Co., Booneville..... |
| 14759                                                         | S. G. Levi Phillips Mixture .....    | Phillips Reinhart, Taylor Co., Booneville..... |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 13391                                                         | S. G. Tupelo German Kainit .....     | C. T. Bonney, Enterprise.....                  |
|                                                               |                                      | Guarantee.....                                 |
| <b>VIRGINIA-CAROLINA CHEMICAL COMPANY,<br/>Memphis, Tenn.</b> |                                      |                                                |
| 13031                                                         | S. G. I. X. L. Acid Phosphate .....  | Mars Bros., Philadelphia.....                  |
| 13520                                                         | S. G. I. X. L. Acid Phosphate .....  | Mars Bros., Philadelphia.....                  |
| 14760                                                         | S. G. I. X. L. Acid Phosphate .....  | R. W. Fagan & Co., Waynesboro.....             |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 12924                                                         | S G Royal Acid Phosphate .....       | J. B. Stevens, Evanston.....                   |
| 13008                                                         | S G Royal Acid Phosphate .....       | J. Niles Boyd, Kosciusko.....                  |
| 13521                                                         | S G Royal Acid Phosphate .....       | J. Niles Boyd, Kosciusko.....                  |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 12866                                                         | Scott's H. G. Acid Phosphate .....   | O. Hopkins, Hickory.....                       |
| 13318                                                         | Scott's H. G. Acid Phosphate .....   | T. S. Turner, Canton.....                      |
| 13522                                                         | Scott's H. G. Acid Phosphate .....   | Ford Bros. Co., Centreville.....               |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 12925                                                         | H. G. V. C. Superphos. 16% .....     | E. P. Donald & Sons, Philadelphia.....         |
| 13523                                                         | H. G. V. C. Superphos. 16% .....     | Tatum & McLain, Gloster.....                   |
| 14761                                                         | H. G. V. C. Superphos. 16% .....     | Ruffin Merc Co., Ellisville.....               |
|                                                               |                                      | Average.....                                   |
|                                                               |                                      | Guarantee.....                                 |
| 13524                                                         | H. G. Victor Acid Phosphate .....    | Tatum & McLain, Gloster.....                   |
|                                                               |                                      | Guarantee.....                                 |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14756              | 12.24              | 6.72                    | 4.13                      | 10.85               | 3.13                | 1.85               | 1.46             | 21.93                   |
| 14757              | 11.80              | 6.84                    | 4.59                      | 11.43               | 2.46                | 1.85               | 1.37             | 22.49                   |
|                    | <b>12.02</b>       | <b>6.78</b>             | <b>4.36</b>               | <b>11.14</b>        | <b>2.79</b>         | <b>1.85</b>        | <b>1.42</b>      | <b>22.21</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 13971              | 15.52              | 9.66                    | 2.56                      | 12.22               | .56                 | 1.51               | 1.72             | 22.55                   |
| 13972              | 15.60              | 10.00                   | 2.48                      | 12.48               | .70                 | 1.49               | 1.54             | 22.60                   |
| 13030              | 18.01              | 9.52                    | 2.28                      | 11.80               | .64                 | 1.59               | 1.55             | 22.24                   |
| 13518              | 15.15              | 9.27                    | 2.63                      | 11.90               | .85                 | 1.81               | 1.53             | 23.24                   |
| 13519              | 14.30              | 8.67                    | 2.58                      | 11.25               | 1.20                | 1.44               | 1.65             | 21.01                   |
|                    | <b>15.71</b>       | <b>9.42</b>             | <b>2.51</b>               | <b>11.93</b>        | <b>.79</b>          | <b>1.57</b>        | <b>1.60</b>      | <b>22.33</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 14758              | 14.53              | 8.84                    | 3.25                      | 12.09               | .47                 | 1.78               | 1.54             | 23.29                   |
| 14759              | 15.19              | 8.66                    | 2.80                      | 11.46               | .51                 | 1.82               | 1.86             | 23.07                   |
|                    | <b>14.86</b>       | <b>8.75</b>             | <b>3.03</b>               | <b>11.78</b>        | <b>.49</b>          | <b>1.80</b>        | <b>1.70</b>      | <b>23.18</b>            |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.31                   |
| 13391              | 2.90               |                         |                           |                     |                     |                    | 13.74            | 13.74                   |
|                    |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| 13031              | 8.80               | 9.17                    | 3.89                      | 13.06               | .43                 |                    |                  | 13.98                   |
| 13520              | 11.27              | 7.55                    | 4.08                      | 11.63               | .32                 |                    |                  | 12.39                   |
| 14760              | 12.00              | 11.37                   | 4.35                      | 15.72               | .59                 |                    |                  | 16.86                   |
|                    | <b>10.69</b>       | <b>9.36</b>             | <b>4.11</b>               | <b>13.47</b>        | <b>.44</b>          |                    |                  | <b>14.41</b>            |
|                    |                    | 8.50                    | 3.50                      | 12.00               | 2.00                |                    |                  | 12.85                   |
| 12924              | 6.89               | 7.09                    | 5.10                      | 12.19               | .85                 |                    |                  | 12.90                   |
| 13008              | 14.86              | 8.71                    | 2.55                      | 11.26               | 1.34                |                    |                  | 12.13                   |
| 13521              | 13.50              | 9.59                    | 3.68                      | 13.27               | 1.06                |                    |                  | 14.23                   |
|                    | <b>11.75</b>       | <b>8.46</b>             | <b>3.78</b>               | <b>12.24</b>        | <b>1.08</b>         |                    |                  | <b>13.09</b>            |
|                    |                    | 8.50                    | 3.50                      | 12.00               | 2.00                |                    |                  | 12.85                   |
| 12866              | 10.43              | 8.80                    | 3.69                      | 12.49               | .32                 |                    |                  | 13.37                   |
| 13318              | 16.67              | 11.44                   | 2.91                      | 14.35               | 1.19                |                    |                  | 15.49                   |
| 13522              | 16.47              | 11.30                   | 3.23                      | 14.53               | .82                 |                    |                  | 15.66                   |
|                    | <b>14.52</b>       | <b>10.51</b>            | <b>3.28</b>               | <b>13.79</b>        | <b>.78</b>          |                    |                  | <b>14.84</b>            |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |
| 12925              | 12.80              | 10.32                   | 3.41                      | 13.73               | .93                 |                    |                  | 14.76                   |
| 13523              | 12.70              | 11.45                   | 3.47                      | 14.92               | .55                 |                    |                  | 16.07                   |
| 14761              | 13.07              | 12.16                   | 4.11                      | 16.27               | .73                 |                    |                  | 17.49                   |
|                    | <b>12.86</b>       | <b>11.31</b>            | <b>3.66</b>               | <b>14.97</b>        | <b>.77</b>          |                    |                  | <b>16.10</b>            |
|                    |                    | 11.50                   | 4.50                      | 16.00               | 2.00                |                    |                  | 17.15                   |
| 13524              | 11.00              | 8.52                    | 3.73                      | 12.25               | .42                 |                    |                  | 13.10                   |
|                    |                    | 10.00                   | 4.00                      | 14.00               | 2.00                |                    |                  | 15.00                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                  | Where and from Whom Collected.          |
|--------------------|--------------------------------------------------|-----------------------------------------|
| 14762              | S. G. Boll Weevil Victor .....                   | G. G. Beaman, Forest.....               |
| 14763              | S. G. Boll Weevil Victor .....                   | Beaman & Co., Forest.....               |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 14764              | S. G. Eclipse Soluble Guano .....                | R. W. Fagan & Co., Waynesboro.....      |
| 14765              | S. G. Eclipse Soluble Guano .....                | R. W. Fagan & Co., Waynesboro.....      |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 13857              | H. G. Ground Animal Bone.....                    | Biloxi Milling Co., Biloxi* .....       |
| 13089              | H. G. Ground Animal Bone.....                    | Biloxi Milling Co., Biloxi *.....       |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 13090              | H. G. Memphis Truck Special.....                 | Biloxi Milling Co., Biloxi .....        |
|                    |                                                  | Guarantee.....                          |
| 12926              | S. G. Mobile Double Eagle<br>Guano .....         | Mars Bros., Philadelphia.....           |
| 13525              | S. G. Mobile Double Eagle<br>Guano .....         | Kennedy Co., Wiggins.....               |
| 13526              | S. G. Mobile Double Eagle<br>Guano .....         | F. L. Riley Merc. Co., New Hebron.....  |
| 13527              | S. G. Mobile Double Eagle<br>Guano .....         | Mars Bros., Philadelphia.....           |
| 13951              | S. G. Mobile Double Eagle<br>Guano .....         | F. L. Riley Merc. Co., New Hebron.....  |
| 13952              | S. G. Mobile Double Eagle<br>Guano .....         | F. L. Riley Merc. Co., New Hebron.....  |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 14254              | S. G. Mobile Am. R. B. Super-<br>phosphate ..... | W. H. Patton, Shubuta.....              |
| 14766              | S. G. Mobile Am. R. B. Super-<br>phosphate ..... | J. W. Shutles & Sons, Brooklyn.....     |
| 14767              | S. G. Mobile Am. R. B. Super-<br>phosphate ..... | Greene & Walters, Guntown.....          |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 12927              | S. G. Mobile Standard Guano .....                | J. B. Stevens, Evanston.....            |
| 13528              | S. G. Mobile Standard Guano .....                | Dorsett & Co., Richton.....             |
| 14768              | S. G. Mobile Standard Guano .....                | Summer Bros., Morton.....               |
| 14769              | S. G. Mobile Standard Guano .....                | Lucedale Com. Co., Lucedale.....        |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |
| 13564              | H. G. Nitrate of Soda.....                       | Weatherbee-Huggins Co., Waynesboro..... |
|                    |                                                  | Guarantee.....                          |
| 14770              | S. G. Richmond Double Eagle<br>Guano .....       | R. W. Fagan & Co., Waynesboro.....      |
| 14771              | S. G. Richmond Double Eagle<br>Guano .....       | R. W. Fagan & Co., Waynesboro.....      |
|                    |                                                  | Average.....                            |
|                    |                                                  | Guarantee.....                          |

\* Samples 13857 and 13089 were drawn from same shipment.

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 14762              | 9.00               | 7.81                    | 2.94                      | 10.75               | .55                 | 1.60               | .70              | 20.11                   |
| 14763              | 10.00              | 8.05                    | 2.86                      | 10.91               | .36                 | 1.85               | .85              | 21.52                   |
|                    | <b>9.50</b>        | <b>7.93</b>             | <b>2.90</b>               | <b>10.83</b>        | <b>.45</b>          | <b>1.73</b>        | <b>.77</b>       | <b>20.81</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | .35              | 19.06                   |
| 14764              | 12.32              | 5.92                    | 3.61                      | 9.53                | .46                 | 1.60               | 1.18             | 19.06                   |
| 14765              | 11.88              | 6.76                    | 3.25                      | 10.01               | 1.61                | 1.64               | 1.38             | 20.04                   |
|                    | <b>12.10</b>       | <b>6.34</b>             | <b>3.43</b>               | <b>9.77</b>         | <b>1.03</b>         | <b>1.62</b>        | <b>1.28</b>      | <b>19.55</b>            |
|                    |                    | 6.50                    | 3.00                      | 9.50                | 2.00                | 1.65               | 1.00             | 19.11                   |
| 13857              | 4.60               |                         |                           |                     | 13.43               | 3.41               |                  | 21.21                   |
| 13089              | 7.27               |                         |                           |                     | 14.71               | 3.52               |                  | 22.32                   |
|                    | <b>5.93</b>        |                         |                           |                     | <b>14.07</b>        | <b>3.47</b>        |                  | <b>21.77</b>            |
|                    |                    |                         |                           |                     | 20.00               | 3.50               |                  | 24.88                   |
| 13090              | 10.26              | 5.50                    | 2.88                      | 8.38                | .98                 | 2.83               | 4.09             | 25.89                   |
|                    |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | 3.30               | 4.00             | 26.23                   |
| 12926              | 10.60              | 7.17                    | 2.08                      | 9.25                | .46                 | 1.57               | 1.85             | 19.41                   |
| 13525              | 11.67              | 7.61                    | 1.99                      | 9.59                | .32                 | 1.95               | 1.46             | 21.06                   |
| 13526              | 11.57              | 7.39                    | 2.30                      | 9.69                | .28                 | 1.68               | 1.57             | 20.11                   |
| 13527              | 13.12              | 7.88                    | 2.20                      | 10.08               | .57                 | 1.60               | 1.57             | 20.25                   |
| 13951              | 11.30              | 8.14                    | 2.09                      | 10.23               | .35                 | 1.95               | 1.07             | 21.42                   |
| 13952              | 11.32              | 8.15                    | 2.63                      | 10.78               | .37                 | 1.77               | .82              | 21.02                   |
|                    | <b>11.59</b>       | <b>7.72</b>             | <b>2.22</b>               | <b>9.94</b>         | <b>.39</b>          | <b>1.75</b>        | <b>1.39</b>      | <b>20.54</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |
| 14254              | 8.80               | 7.96                    | 2.94                      | 10.90               | 2.51                | 1.55               | 1.93             | 21.30                   |
| 14766              | 8.26               | 7.08                    | 4.12                      | 11.20               | .91                 | 1.89               | 1.50             | 22.56                   |
| 14767              | 12.27              | 7.60                    | 2.99                      | 10.59               | .96                 | 1.69               | 1.36             | 20.95                   |
|                    | <b>9.78</b>        | <b>7.55</b>             | <b>3.35</b>               | <b>10.90</b>        | <b>1.46</b>         | <b>1.71</b>        | <b>1.60</b>      | <b>21.60</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |
| 12927              | 8.88               | 6.85                    | 3.47                      | 10.32               | 1.39                | 1.65               | 2.85             | 21.90                   |
| 13528              | 12.57              | 6.30                    | 3.02                      | 9.32                | .60                 | 1.47               | 1.92             | 19.05                   |
| 14768              | 7.32               | 6.25                    | 2.65                      | 8.90                | .19                 | 1.92               | 1.97             | 20.55                   |
| 14769              | 12.74              | 7.42                    | 2.28                      | 9.70                | .31                 | 1.75               | 2.04             | 20.89                   |
|                    | <b>10.38</b>       | <b>6.71</b>             | <b>2.85</b>               | <b>9.56</b>         | <b>.62</b>          | <b>1.70</b>        | <b>2.19</b>      | <b>20.60</b>            |
|                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65               | 2.00             | 18.96                   |
| 13564              | 3.47               |                         |                           |                     |                     | 14.78              |                  | 62.82                   |
|                    |                    |                         |                           |                     |                     | 15.00              |                  | 63.75                   |
| 14770              | 13.56              | 7.53                    | 2.67                      | 10.20               | .31                 | 1.25               | 1.65             | 18.94                   |
| 14771              | 11.94              | 8.37                    | 3.06                      | 11.43               | 2.07                | 1.82               | 1.61             | 22.76                   |
|                    | <b>12.75</b>       | <b>7.95</b>             | <b>2.86</b>               | <b>10.81</b>        | <b>1.19</b>         | <b>1.54</b>        | <b>1.63</b>      | <b>20.85</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |

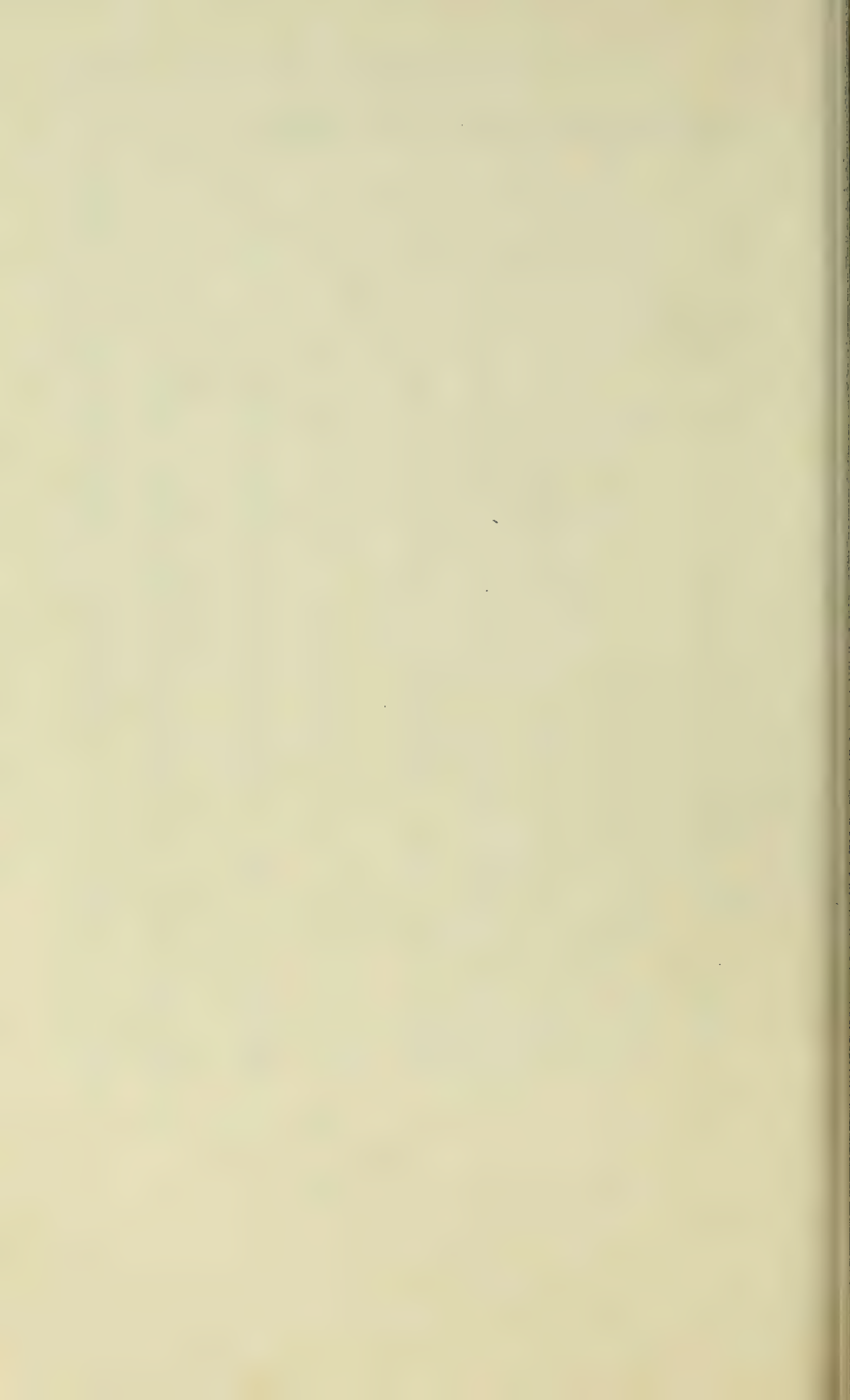


TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                         | Name of Brand and Manufacturer.       | Where and from Whom Collected.                                       |
|------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------|
| 13319                                                      | S. G. Royal Blood, Bone & Potash..... | T. S. Turner, Canton.....                                            |
| 13565                                                      | S. G. Royal Blood, Bone & Potash..... | Weatherbee-Huggins Co., Waynesboro<br>Average.....<br>Guarantee..... |
| 14772                                                      | S. G. Royal Cot. Boll Guano.....      | McLain & King, Bassfield.....                                        |
| 13953                                                      | S. G. Royal Cot. Boll Guano.....      | Barnes & Co., Columbia.....                                          |
| 13954                                                      | S. G. Royal Cot. Boll Guano.....      | Barnes & Co., Columbia.....<br>Average.....<br>Guarantee.....        |
| 13320                                                      | S. G. Scott's Gossypium Phospho.....  | T. S. Turner, Canton.....                                            |
| 12928                                                      | S. G. Scott's Gossypium Phospho.....  | J. B. Stevens, Evanston.....                                         |
| 13032                                                      | S. G. Scott's Gossypium Phospho.....  | Harpole & Marshall, Eupora.....                                      |
| 13091                                                      | S. G. Scott's Gossypium Phospho.....  | Biloxi Milling Co., Biloxi.....                                      |
| 13529                                                      | S. G. Scott's Gossypium Phospho.....  | C. C. Fancher, McCool.....                                           |
| 14293                                                      | S. G. Scott's Gossypium Phospho.....  | Williams & Freeman, Sandersville.....                                |
| 14394                                                      | S. G. Scott's Gossypium Phospho.....  | Wagner & Co., Water Valley.....                                      |
| 14395                                                      | S. G. Scott's Gossypium Phospho.....  | Wagner & Co., Water Valley.....<br>Average.....<br>Guarantee.....    |
| 14396                                                      | H. G. Scott's Potasso Phospho.....    | J. Niles Boyd, Kosciusko.....                                        |
| 14397                                                      | H. G. Scott's Potasso Phospho.....    | J. Niles Boyd, Kosciusko.....<br>Average.....<br>Guarantee.....      |
| 14773                                                      | H. G. Victor Guano.....               | Weatherbee-Huggins Co., Waynesboro<br>Guarantee.....                 |
| 13530                                                      | S. G. V. C. C. Standard Guano.....    | Tatum & McLain, Gloster.....                                         |
| 13913                                                      | S. G. V. C. C. Standard Guano.....    | Tatum & McLain, Gloster.....                                         |
| 14774                                                      | S. G. V. C. C. Standard Guano.....    | McCullar & Co., Booneville.....<br>Average.....<br>Guarantee.....    |
| <b>WESSON COTTON OIL &amp; FERT. CO.,</b><br>Wesson, Miss. |                                       |                                                                      |
| 12684                                                      | S. G. Mutual Friend Mixture.....      | Wesson Cotton Oil & Fert. Co., Wesson<br>Guarantee.....              |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 13319              | 12.72              | 8.23                    | 2.83                      | 11.06               | .89                 | 1.52               | 1.98             | 21.43                   |
| 13565              | 11.37              | 7.53                    | 3.10                      | 10.63               | .36                 | 1.61               | 1.72             | 21.01                   |
|                    | <b>12.04</b>       | <b>7.88</b>             | <b>2.97</b>               | <b>10.85</b>        | <b>.62</b>          | <b>1.56</b>        | <b>1.85</b>      | <b>21.22</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |
| 14772              | 6.21               | 5.29                    | 3.39                      | 8.68                | .47                 | 1.95               | 1.09             | 19.45                   |
| 13953              | 7.32               | 6.77                    | 2.97                      | 9.74                | .64                 | 1.63               | 2.04             | 20.36                   |
| 13954              | 6.80               | 6.57                    | 2.79                      | 9.36                | .50                 | 1.65               | 2.18             | 20.15                   |
|                    | <b>6.78</b>        | <b>6.21</b>             | <b>3.05</b>               | <b>9.26</b>         | <b>.53</b>          | <b>1.74</b>        | <b>1.77</b>      | <b>19.98</b>            |
|                    |                    | 6.00                    | 2.50                      | 8.50                | 2.00                | 1.65               | 2.00             | 18.96                   |
| 13320              | 12.02              | 8.67                    | 2.67                      | 11.34               | .88                 | 1.64               | 2.09             | 22.40                   |
| 12928              | 9.19               | 6.70                    | 1.99                      | 8.69                | .56                 | 1.59               | 2.14             | 19.13                   |
| 13032              | 9.79               | 7.00                    | 2.52                      | 9.52                | .33                 | 1.68               | 1.39             | 19.70                   |
| 13091              | 13.96              | 7.87                    | 2.72                      | 10.59               | .66                 | 1.54               | 1.54             | 20.52                   |
| 13529              | 9.70               | 7.26                    | 2.11                      | 9.37                | .21                 | 1.62               | 1.64             | 19.56                   |
| 14293              | 10.25              | 6.99                    | 2.64                      | 9.63                | .26                 | 1.57               | 1.71             | 19.67                   |
| 14394              | 11.77              | 8.05                    | 2.43                      | 10.48               | .42                 | 1.76               | 1.95             | 21.76                   |
| 14395              | 11.17              | 7.45                    | 2.42                      | 9.87                | .39                 | 1.73               | 1.60             | 20.55                   |
|                    | <b>10.98</b>       | <b>7.50</b>             | <b>2.44</b>               | <b>9.94</b>         | <b>.46</b>          | <b>1.64</b>        | <b>1.76</b>      | <b>20.41</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |
| 14396              | 11.18              | 7.91                    | 4.70                      | 12.61               | 1.25                |                    | 2.02             | 16.68                   |
| 14397              | 11.55              | 7.90                    | 4.52                      | 12.42               | 1.28                |                    | 2.10             | 16.55                   |
|                    | <b>11.37</b>       | <b>7.91</b>             | <b>4.61</b>               | <b>12.52</b>        | <b>1.26</b>         |                    | <b>2.06</b>      | <b>16.62</b>            |
|                    |                    | 8.00                    | 4.00                      | 12.00               | 2.00                |                    | 2.00             | 16.00                   |
| 14773              | 11.16              | 7.86                    | 3.50                      | 11.36               | .79                 | 2.50               | 1.21             | 25.12                   |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 3.30               | 1.50             | 27.23                   |
| 13530              | 11.75              | 7.14                    | 2.11                      | 9.25                | .22                 | 1.69               | 1.69             | 19.76                   |
| 13913              | 11.65              | 7.63                    | 2.30                      | 9.93                | .25                 | 1.67               | 1.58             | 20.36                   |
| 14774              | 14.82              | 7.33                    | 2.95                      | 10.28               | .80                 | 1.40               | 1.49             | 19.48                   |
|                    | <b>12.74</b>       | <b>7.37</b>             | <b>2.45</b>               | <b>9.82</b>         | <b>.42</b>          | <b>1.59</b>        | <b>1.59</b>      | <b>19.87</b>            |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 20.21                   |
| 12684              | 9.91               | 6.98                    | 3.78                      | 10.76               | .57                 | 1.62               | 1.98             | 21.40                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 1.00                | 1.65               | 1.75             | 19.36                   |



Mississippi Agricultural Experiment Station  
Agricultural College, Mississippi

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BULLETIN No. 143.
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INSPECTION AND ANALYSES  
OF COTTONSEED MEAL  
ON SALE IN MISSISSIPPI.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

DECEMBER, 1910.

MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.

Inspection and Analyses of Cottonseed Meal.

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THE INSPECTION OF COTTON-SEED MEAL.

Introduction.—Since the publication in April of this year of bulletin No. 128, containing analyses of 223 samples of cottonseed meal, analyses of 407 samples have been completed and the results will be found in the table which follows. These samples were drawn in various parts of the state and the analyses made from time to time throughout the year indicate the quality of the meal supplied the trade by various mills.

An accurate analysis supplies the data upon which an intelligent purchase of sound cottonseed meal must be based, and whether the purchaser intends it for feeding animals or for direct use as a fertilizer (i. e., for feeding plants) its value in either case must be most largely measured by the **nitrogen content**. The analyses given here are sufficient to bring out the fact that significant variations in quality are not uncommon. Farmers and feeders must bear in mind the fact that the **nitrogen** in cottonseed meal is its most valuable constituent whether used as a fertilizer or employed as a feed, and hence meal diluted with a large percentage of finely ground hulls should be sold at a reduced price because hulls contain very little nitrogen.

Dealers themselves who may be primarily interested in the profit in handling must finally come to consider more closely the analyses as a basis of quality, and the farmer and feeder will share in the advantage thus gained in purchasing the valuable constituents in meal at the lowest cost per pound.

The price per ton of meal should not be considered apart from the composition as shown by analysis or guaranty. The competition based almost alone on the price of a ton is doubtless responsible for many very unwise purchases of cottonseed meal. A competition based on both quality and price ought to be fostered by manufacturers and dealers.

Comparison of values.—That the various grades of meal are made by mixing hulls with the kernels before pressing is well known. From the point of view of the purchaser the use of more hulls than is necessary in crushing presents no special advantage, while it is a distinct

disadvantage to those who buy meal without due regard to its quality as shown by analysis.

If meal carries a large percentage of hulls the percentage of **nitrogen** in it will not be as high as that in meal of better grade because hulls contain very little nitrogen. If the meal containing the larger amount of hulls is not sold for a **correspondingly lower price**, the buyer may find that he is asked to pay for the hulls in the meal the same price asked for good meal.

Nor is it sufficient for the purchaser to conclude that an arbitrary difference of, say, a dollar per ton is an approximate measure of the actual difference in value between two grades of meal. If a **high grade** meal carrying, say, 6.50% of nitrogen can be bought for \$30.00 a ton, a **standard grade** meal containing enough hulls to depress the percentage of nitrogen to, say, 5.25% is worth approximately, \$24.25, a difference of \$5.75, when the nitrogen in the two grades is used as a basis of comparison. The lower grade of meal will contain a larger amount of hulls for which the buyer may pay the market price if he so desires. Such a procedure in practice would probably result in much confusion.

Table of Comparative Values.

Meal of good quality can be bought now for \$28.00 a ton. Assuming this to contain an average of 6.50% of nitrogen the comparative value based on nitrogen content of lower grades of meal (i. e., those containing more hulls) may be computed; for, if meal containing 6.50% of nitrogen is worth \$28.00, a grade containing, say, 5.25% of nitrogen will be worth, on this basis, \$22.61, since,

$$6.50\% : 5.25\% :: \$28.00 : x \quad \text{wherein} \\ x = \$ 22.61$$

The following table is inserted for convenience of comparing the prices which should be paid for several grades of meal when these grades are compared on the nitrogen basis. It is assumed that meal containing 6.50% of nitrogen can be bought for \$28.00 a ton.

Meal containing 6.50% of nitrogen	\$28.00 per ton.
Meal containing 6.40% of nitrogen.....	27.67 per ton.
Meal containing 6.30% of nitrogen.....	27.13 per ton.
Meal containing 6.20% of nitrogen	26.71 per ton.
Meal containing 6.00% of nitrogen.....	25.84 per ton.
Meal containing 5.90% of nitrogen.....	25.41 per ton.
Meal containing 5.80% of nitrogen.....	24.98 per ton.
Meal containing 5.60% of nitrogen.....	24.12 per ton.
Meal containing 5.50% of nitrogen.....	23.70 per ton.
Meal containing 5.40% of nitrogen.....	23.26 per ton.
Meal containing 5.30% of nitrogen.....	22.83 per ton.
Meal containing 5.20% of nitrogen.....	22.40 per ton.
Meal containing 5.10% of nitrogen.....	21.97 per ton.
Meal containing 3.50% of nitrogen.....	15.07 per ton.

General results of the inspection.—With very few exceptions the samples collected by inspectors have been found **well above** the guaranties made for them. This indicates a most encouraging state of affairs in the cottonseed meal trade. A number of mills might easily raise guaranties if the analyses found here will be maintained during 1910-1911.

Some mills are making meal containing practically 7.00% of nitrogen, and one has no sample representing its meal which does not carry over 7.00% nitrogen.

While there exists differences in quality, guaranties are almost always exceeded and the mills are to be congratulated upon the very excellent standard fixed by these analyses. If this standard is maintained in the future, the purchasing public will have little cause for complaint, and the Department hopes that the record for this season will not be lowered by a single mill during the coming year.

The J. Lindsay Wells Company, of Memphis, Tenn., made a number of shipments of "Sunny South" meal which were adulterated with hulls or "cottonseed bran." Only one consignment was located in time for attachment. Analyses on page (36) will show the extreme deficiencies brought to light. Especial attention will be given this matter during the coming season.

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ALABAMA COTTON OIL CO., Mobile, Ala.	
14810	H. G. Cottonseed Meal	McInnis Bros., Moss Point.....
	ALCORN COTTON OIL COMPANY, Corinth, Miss.	
13415	H. G. Cottonseed Meal	Alcorn Cotton Oil Co., Corinth.....
	ARCOLA OIL MILL, Arcola, Miss.	
14811	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola.....
	BARBER & LEWIS OIL COMPANY, Edwards, Miss.	
14812	H. G. Cottonseed Meal	L. D. Spell and Bro., Georgetown.....
14813	H. G. Cottonseed Meal	H. N. Stuart Merc. Co., Morton.....
14814	H. G. Cottonseed Meal	W. M. Hyde & Co., Poplarville.....
14815	H. G. Cottonseed Meal	W. M. Prine, Weathersby.....
14816	H. G. Cottonseed Meal	The Hannah Distributing Co., Jackson.....
14817	H. G. Cottonseed Meal	C. J. Edwards, Vicksburg.....
14818	H. G. Cottonseed Meal	Holloway & McRaney, Collins.....
14819	H. G. Cottonseed Meal	Picayune Cash Store, Picayune.....
14820	H. G. Cottonseed Meal	Barber & Lewis Oil Co., Edwards.....
14821	H. G. Cottonseed Meal	D. G. Patton Co., Jackson.....
	BARLOW OIL MILL COMPANY, Barlow, Miss.	
14822	H. G. Cottonseed Meal	Barlow Oil Mill Co., Barlow.....
	BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.	
14823	H. G. Cottonseed Meal	Holloway & Worthy, Carson.....
14824	H. G. Cottonseed Meal	Brookhaven Cotton Oil & Fertilizer Co., Brookhaven.....
14825	H. G. Cottonseed Meal	W. J. Carter, Bassfield.....
14826	H. G. Cottonseed Meal	O. D. Crenshaw, Neshoba.....
14827	H. G. Cottonseed Meal	Sumrall Merc. Co., Sumrall.....
14828	H. G. Cottonseed Meal	Holloway & McRaney, Collins.....
14829	H. G. Cottonseed Meal	McNeil Branch Exp. Station, McNeil.....
14830	H. G. Cottonseed Meal	W. W. Pigford, Lumberton.....
14831	H. G. Cottonseed Meal	J. H. Williams & Sons, Prentiss.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14810	8.46	6.91	6.18	8.40	7.51	31.10	27.81
13415	8.19	6.54	6.18	7.95	7.51	29.43	27.81
14811	7.75	6.55	6.18	7.96	7.51	29.48	27.81
14812	9.03	6.02	6.18	7.32	7.51	27.09	27.81
14813	8.96	6.42	6.18	7.81	7.51	28.89	27.81
14814	8.20	6.93	6.18	8.43	7.51	31.19	27.81
14815	9.18	6.52	6.18	7.93	7.51	29.34	27.81
14816	8.96	6.49	6.18	7.89	7.51	29.21	27.81
14817	8.84	6.48	6.18	7.88	7.51	29.16	27.81
14818	7.65	6.75	6.18	8.21	7.51	30.38	27.81
14819	7.48	6.54	6.18	7.95	7.51	29.43	27.81
14820	8.43	6.58	6.18	8.00	7.51	29.61	27.81
14821	7.90	6.26	6.18	7.61	7.51	28.17	27.81
14822	7.88	7.63	6.18	9.28	7.51	34.34	27.81
14823	7.05	6.20	6.20	7.54	7.54	27.90	27.90
14824	7.10	7.37	6.20	8.96	7.54	33.17	27.90
14825	7.35	6.73	6.20	8.18	7.54	30.29	27.90
14826	6.61	6.47	6.20	7.87	7.54	29.12	27.90
14827	7.28	6.61	6.20	8.04	7.54	29.75	27.90
14828	7.35	6.52	6.20	7.93	7.54	29.34	27.90
14829	7.76	6.17	6.20	7.50	7.54	27.77	27.90
14830	6.44	6.71	6.20	8.16	7.54	30.20	27.90
14831	7.22	6.93	6.20	8.43	7.54	31.19	27.90

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
14832	S. G. Cottonseed Meal	Brookhaven Cotton Oil & Fert. Co., Brookhaven
14833	S. G. Cottonseed Meal	W. J. Carter, Bassfield
14834	S. G. Cottonseed Meal	W. J. Carter, Bassfield
	BUCKEYE COTTON OIL CO., Jackson, Miss.	
14835	H. G. Cottonseed Meal	Quitman Merc. Co., Quitman
14836	H. G. Cottonseed Meal	Guy Northrop, Pass Christian
14837	H. G. Cottonseed Meal	Gaddis, McLaurin & Greaves, Clinton
14840	H. G. Cottonseed Meal	The Ball Merc. Co., Columbia
14841	H. G. Cottonseed Meal	Foote-Patrick Company, Laurel
14842	H. G. Cottonseed Meal	Buckley-Terry Company, Laurel
14843	H. G. Cottonseed Meal	The Hall Company, Laurel
14846	H. G. Cottonseed Meal	Hattiesburg Grocery Co., Hattiesburg
14847	H. G. Cottonseed Meal	W. M. Conner, Hattiesburg
14848	H. G. Cottonseed Meal	N. B. Blount, Hattiesburg
14849	H. G. Cottonseed Meal	Farmers Warehouse Co., Goodman
14850	H. G. Cottonseed Meal	J. S. Allred, Hazlehurst
14851	H. G. Cottonseed Meal	Fernwood Lumber Co., Fernwood
14852	H. G. Cottonseed Meal	G. B. Hall, Columbia
14856	H. G. Cottonseed Meal	Barnes Merc. Co., Columbia
14857	H. G. Cottonseed Meal	W. F. Gordon, Pickens
14858	H. G. Cottonseed Meal	J. P. Cox Merc. Co., Braxton
14859	H. G. Cottonseed Meal	J. S. Eaton & Bro., Taylorsville
14860	H. G. Cottonseed Meal	Conner Lumber Co., Seminary
14861	H. G. Cottonseed Meal	W. M. Conner, Hattiesburg
14863	S. G. Cottonseed Meal	The Rankin Co., Columbia
14864	H. G. Cottonseed Meal	McHenry Merc. Co., McHenry
14867	H. G. Cottonseed Meal	Weathersbee-Huggins Co., Waynesboro
14869	H. G. Cottonseed Meal	Farmers Warehouse Co., Osyka
14870	H. G. Cottonseed Meal	Buckeye Cotton Oil Co., Jackson
14872	H. G. Cottonseed Meal	Smythe-Gaddis & Co., Forest
14874	H. G. Cottonseed Meal	T. S. Turner, Canton
14875	H. G. Cottonseed Meal	Merchants Grocery Co., Hattiesburg
14876	H. G. Cottonseed Meal	Conner Lumber Co., Seminary
14877	H. G. Cottonseed Meal	Buckley-Terry Co., Laurel
14878	H. G. Cottonseed Meal	The Lampton Co., Columbia
15208	H. G. Cottonseed Meal	The Hood Milling Co., Gulfport
	BUCKEYE COTTON OIL COMPANY, Greenwood, Miss.	
14838	H. G. Cottonseed Meal	W. H. Patton, Shubuta
14839	H. G. Cottonseed Meal	D. C. Griffith & Co., Silver Creek
14844	H. G. Cottonseed Meal	Donald Bros., Magee
14845	H. G. Cottonseed Meal	Merchants Grocery Co., Hattiesburg
14853	H. G. Cottonseed Meal	Columbia Grocery Co., Columbia
14854	H. G. Cottonseed Meal	Farmers Warehouse Co., Mathiston

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14832	7.05	5.52	4.95	6.71	6.02	24.84	22.28
14833	7.50	5.69	4.95	6.92	6.02	25.61	22.28
14834	7.31	5.74	4.95	6.98	6.02	25.83	22.28
14835	7.56	6.42	6.18	7.81	7.51	28.89	27.81
14836	7.08	6.79	6.18	8.26	7.51	30.56	27.81
14837	7.14	6.53	6.18	7.94	7.51	29.39	27.81
14840	8.23	6.61	6.18	8.04	7.51	29.75	27.81
14841	8.25	6.64	6.18	8.07	7.51	29.88	27.81
14842	8.00	6.28	6.18	7.64	7.51	28.26	27.81
14843	8.31	6.99	6.18	8.50	7.51	31.46	27.81
14846	8.37	6.65	6.18	8.09	7.51	29.93	27.81
14847	8.03	6.60	6.18	8.02	7.51	29.70	27.81
14848	7.96	6.56	6.18	7.98	7.51	29.52	27.81
14849	7.77	6.70	6.18	8.15	7.51	30.15	27.81
14850	7.91	6.64	6.18	8.07	7.51	29.88	27.81
14851	8.14	6.33	6.18	7.70	7.51	28.49	27.81
14852	7.96	6.63	6.18	8.06	7.51	29.84	27.81
14856	8.11	6.71	6.18	8.16	7.51	30.20	27.81
14857	7.51	6.63	6.18	8.06	7.51	29.84	27.81
14858	7.85	6.88	6.18	8.36	7.51	30.96	27.81
14859	8.23	6.04	6.18	7.34	7.51	27.18	27.81
14860	6.82	6.18	6.18	7.51	7.51	27.81	27.81
14861	7.04	6.82	6.18	8.29	7.51	30.69	27.81
14863	7.72	6.58	6.18	8.00	7.51	29.61	27.81
14864	7.06	6.61	6.18	8.04	7.51	29.75	27.81
14867	7.82	6.55	6.18	7.96	7.51	29.48	27.81
14869	7.37	6.50	6.18	7.90	7.51	29.25	27.81
14870	7.28	6.39	6.18	7.77	7.51	28.76	27.81
14872	7.69	6.69	6.18	8.13	7.51	30.11	27.81
14874	6.95	6.83	6.18	8.30	7.51	30.74	27.81
14875	7.20	6.23	6.18	7.57	7.51	28.04	27.81
14876	7.37	6.61	6.18	8.04	7.51	29.75	27.81
14877	6.79	6.33	6.18	7.70	7.51	28.49	27.81
14878	8.92	6.49	6.18	7.89	7.51	29.21	27.81
15208	9.23	5.99	6.18	7.28	7.51	26.96	27.81
14838	7.81	6.67	6.18	8.11	7.51	30.02	27.81
14839	8.60	6.56	6.18	7.98	7.51	29.52	27.81
14844	8.00	6.43	6.18	7.82	7.51	28.94	27.81
14845	8.17	6.22	6.18	7.56	7.51	27.99	27.81
14853	6.91	6.80	6.18	8.27	7.51	30.60	27.81
14854	8.16	6.86	6.18	8.34	7.51	30.87	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
14855	H. G. Cottonseed Meal	The Kennedy Co., Wiggins
14862	H. G. Cottonseed Meal	D. C. Griffith & Co., Silver Creek
14865	H. G. Cottonseed Meal	McHenry Trading Co., McHenry
14866	H. G. Cottonseed Meal	McInnis & Stevenson Co., Poplarville
14868	H. G. Cottonseed Meal	Buckeye Cotton Oil Co., Greenwood
14871	H. G. Cottonseed Meal	J. R. Ruffin Co., New Augusta
14873	H. G. Cottonseed Meal	J. S. Jones, McCool
	BUTLER-KEYSER OIL & FERTILIZER COMPANY, Fayette, Miss.	
14879	H. G. Cottonseed Meal	Butler-Keyser Oil & Fert. Co., Fayette
	CANTON OIL MILL COMPANY, Canton, Miss.	
14880	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs.
	CENTRAL COTTON OIL COMPANY, Jackson, Miss.	
14881	H. G. Cottonseed Meal	Gaddis, McLaurin & Greaves, Clinton
14882	H. G. Cottonseed Meal	Biloxi Milling Company, Biloxi
14883	H. G. Cottonseed Meal	The Kennedy Company, Wiggins
14884	H. G. Cottonseed Meal	J. S. Adkinson, McHenry
14885	H. G. Cottonseed Meal	McHenry Merc. Co., McHenry
14886	H. G. Cottonseed Meal	J. J. Bourne & Co., Arm
14887	H. G. Cottonseed Meal	Conner Lumber Co., Seminary
14888	H. G. Cottonseed Meal	Barnes & Co., Columbia
14889	H. G. Cottonseed Meal	Central Cotton Oil Co., Jackson
14890	H. G. Cottonseed Meal	McClelland & Smith, Jackson
14891	H. G. Cottonseed Meal	R. H. Green & Bro., Jackson
14892	H. G. Cottonseed Meal	The Rankin Co., Columbia
14893	H. G. Cottonseed Meal	Ship Island Lumber Co., Sanford
14894	H. G. Cottonseed Meal	Gulfport Grocery Co., Gulfport
	CENTREVILLE COTTON OIL CO., Centreville, Miss.	
14895	S. G. Cottonseed Meal	Ford Bros. Co., Centreville
	CLAY COUNTY COTTON OIL CO., West Point, Miss.	
14228	H. G. Cottonseed Meal	E. F. Nunn & Co., Shuqualak
14227	H. G. Cottonseed Meal	L. A. Sanderson, Vardaman
14896	H. G. Cottonseed Meal	Phillips, Reinhart, Taylor Co., Booneville
14226	H. G. Cottonseed Meal	Clay County Cotton Oil Co., West Point

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14852	7.08	6.11	6.18	7.43	7.51	27.50	27.81
14862	8.05	6.28	6.18	7.64	7.51	28.26	27.81
14865	7.83	6.13	6.18	7.45	7.51	27.59	27.81
14866	7.80	6.32	6.18	7.68	7.51	28.44	27.81
14868	7.88	6.09	6.18	7.40	7.51	27.41	27.81
14871	7.61	6.20	6.18	7.54	7.51	27.90	27.81
14873	7.42	6.88	6.18	8.36	7.51	30.96	27.81
14879	9.04	6.88	6.18	8.36	7.51	30.96	27.81
14880	8.30	6.54	6.18	7.95	7.51	29.43	27.81
14881	8.96	6.89	6.18	8.38	7.51	31.01	27.81
14882	8.89	6.64	6.18	8.07	7.51	29.88	27.81
14883	8.49	6.74	6.18	8.19	7.51	30.33	27.81
14884	8.24	6.65	6.18	8.09	7.51	29.93	27.81
14885	8.24	6.84	6.18	8.32	7.51	30.78	27.81
14886	8.84	7.06	6.18	8.58	7.51	31.77	27.81
14887	9.21	6.39	6.18	7.77	7.51	28.76	27.81
14888	8.87	6.62	6.18	8.05	7.51	29.79	27.81
14889	8.68	6.77	6.18	8.23	7.51	30.47	27.81
14890	8.51	6.84	6.18	8.32	7.51	30.78	27.81
14891	8.85	6.39	6.18	7.77	7.51	28.76	27.81
14892	7.90	7.00	6.18	8.51	7.51	31.50	27.81
14893	8.31	6.62	6.18	8.05	7.51	29.79	27.81
14894	8.34	6.85	6.18	8.33	7.51	30.83	27.81
14895	8.34	6.80	5.00	8.27	6.08	30.60	22.50
14228	9.73	6.58	6.18	8.00	7.51	29.61	27.81
14227	8.23	6.84	6.18	8.32	7.51	30.78	27.81
14896	7.32	6.89	6.18	8.38	7.51	31.01	27.81
14226	9.05	6.44	6.18	7.83	7.51	28.98	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
14897	S. G. Cottonseed Meal	J. W. Carter, Scooba.....
14898	S. G. Cottonseed Meal	Clay County Cotton Oil Co., West P't.
	COLDWATER COTTON OIL CO., Coldwater, Miss.	
14899	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater....
14900	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater....
14901	H. G. Cottonseed Meal	Coldwater Cotton Oil Co., Coldwater....
	CRENSHAW OIL COMPANY, Crenshaw, Miss.	
14902	S. G. Cottonseed Meal	Crenshaw Oil Co., Crenshaw.....
	CRESCENT COTTON OIL COMPANY, Memphis, Tenn.	
14903	H. G. Cottonseed Meal	C. M. Elder, New Albany.....
	CRYSTAL SPRINGS OIL MILL, FER- TILIZER & M'F'G. COMPANY, Crystal Springs, Miss.	
14904	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs
14905	H. G. Cottonseed Meal	Lotterhos & Huber Co., Crystal Sp'gs
	DELTA OIL COMPANY, Greenville, Miss.	
14906	S. G. Cottonseed Meal	Delta Oil Company, Greenville.....
	DeSOTO OIL COMPANY, Greenville, Miss.	
14907	H. G. Cottonseed Meal	C. H. Stevens & Company, Richton....
14908	H. G. Cottonseed Meal	T. E. Winn, Laurel.....
14909	H. G. Cottonseed Meal	Ruffin Merc. Co., Ellisville.....
14910	H. G. Cottonseed Meal	J. L. Parkman, Oakvale.....
14911	H. G. Cottonseed Meal	DeSoto Oil Company, Greenville.....
14912	H. G. Cottonseed Meal	J. R. Ruffin Company, New Augusta
14913	H. G. Cottonseed Meal	Kennedy Bros., New Augusta
14914	H. G. Cottonseed Meal	The Tate Company, Laurel.....
14915	H. G. Cottonseed Meal	Caldwell Bros., Ellisville.....
14916	H. G. Cottonseed Meal	Anderson Merc. Co., Richton.....
14917	H. G. Cottonseed Meal	Caldwell Bros., Ellisville.....
14918	H. G. Cottonseed Meal	C. H. Stevens Company, Richton.....
14919	H. G. Cottonseed Meal	Foote-Patrick Co., Laurel.....
14920	H. G. Cottonseed Meal	Stonewall Cotton Mills, Stonewall.....
14921	H. G. Cottonseed Meal	W. L. Weems, Shubuta.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14897	8.54	6.47	4.95	7.87	6.02	29.12	22.28
14898	8.87	5.63	4.95	6.48	6.02	25.34	22.28
14899	8.62	6.80	6.18	8.27	7.51	30.60	27.81
14900	8.93	7.02	6.18	8.53	7.51	31.59	27.81
14901	8.35	6.75	6.18	8.21	7.51	30.38	27.81
14902	8.72	6.88	4.95	8.36	6.02	30.96	22.28
14903	8.76	6.40	6.18	7.78	7.51	28.80	27.81
14904	6.98	7.42	6.25	9.02	7.60	33.39	28.13
14905	7.36	7.23	6.25	8.79	7.60	32.54	28.13
14906	8.79	6.00	4.95	7.29	6.02	27.00	22.28
14907	7.47	6.25	6.18	7.60	7.51	28.13	27.81
14908	7.95	6.44	6.18	7.83	7.51	28.98	27.81
14909	8.22	6.43	6.18	7.82	7.51	28.94	27.81
14910	7.53	6.44	6.18	7.83	7.51	28.98	27.81
14911	7.61	6.13	6.18	7.45	7.51	27.59	27.81
14912	7.28	6.30	6.18	7.66	7.51	28.35	27.81
14913	7.40	6.02	6.18	7.32	7.51	27.09	27.81
14914	7.38	6.58	6.18	8.00	7.51	29.61	27.81
14915	6.90	6.46	6.18	7.85	7.51	29.07	27.81
14916	7.30	6.49	6.18	7.89	7.51	29.21	27.81
14917	6.96	6.47	6.18	7.87	7.51	29.12	27.81
14918	7.05	6.28	6.18	7.64	7.51	28.26	27.81
14919	6.98	6.32	6.18	7.68	7.51	28.44	27.81
14920	7.05	6.26	6.18	7.61	7.51	28.17	27.81
14921	7.40	6.51	6.18	7.91	7.51	29.30	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
14922	H. G. Cottonseed Meal	Cross Bros. & Sumner, Pelahatchie
14923	H. G. Cottonseed Meal	Edwell & McCormick, Hickory
	EAGLE COTTON OIL COMPANY, Meridian, Miss.	
14924	H. G. Cottonseed Meal	R. W. Fagan & Co., Waynesboro
14925	H. G. Cottonseed Meal	R. W. Fagan & Co., Waynesboro
14926	H. G. Cottonseed Meal	E. P. Brown, Lockhart
14927	H. G. Cottonseed Meal	O. Hopkins, Hickory
14928	H. G. Cottonseed Meal	J. B. & R. A. Pool, Union
14929	H. G. Cottonseed Meal	McLeod & Co., Purvis
14930	H. G. Cottonseed Meal	Jas. O'Connell, Purvis
14931	H. G. Cottonseed Meal	Stockstill, McGehee & Co., Picayune
14932	H. G. Cottonseed Meal	R. W. Fagan & Co., Waynesboro
14933	H. G. Cottonseed Meal	Eagle Cotton Oil Co., Meridian
14934	H. G. Cottonseed Meal	Forest Gin & M'fg. Co., Forest
14935	H. G. Cottonseed Meal	Eureka Lumber Co., Eastabuchie
14936	H. G. Cottonseed Meal	R. W. Fagan & Co., Waynesboro
14937	H. G. Cottonseed Meal	W. E. Laird, Hattiesburg
14938	H. G. Cottonseed Meal	Forest Gin & M'fg. Co., Forest
14939	H. G. Cottonseed Meal	T. B. Gaddis, Morton
14940	H. G. Cottonseed Meal	W. M. Hyde & Co., Poplarville
13923	H. G. Cottonseed Meal	J. D. Gulley, Lauderdale
	EASTMAN OIL MILL, Jonestown, Miss.	
14941	H. G. Cottonseed Meal	Eastman Oil Mill, Jonestown
14942	H. G. Cottonseed Meal	Eastman Oil Mill, Jonestown
	EXPORTERS' COTTON OIL CO., Gulfport, Miss.	
14943	H. G. Cottonseed Meal	Biloxi Milling Co., Biloxi
	A. H. GEORGE & COMPANY, Meridian, Miss.	
14944	H. G. Cottonseed Meal	R. W. Hinton & Co., Lumberton
14945	H. G. Cottonseed Meal	R. W. Hinton & Co., Lumberton
14946	H. G. Cottonseed Meal	Myer Bros., Meridian
14947	H. G. Cottonseed Meal	Gulfport Grocery Co., Gulfport
14948	H. G. Cottonseed Meal	Donald Bros., Magee
14949	H. G. Cottonseed Meal	J. S. Adkinson, McHenry
14950	H. G. Cottonseed Meal	Foote-Patrick Co., Laurel
	J. T. GIBBONS, New Orleans, La.	
14951	H. G. Cottonseed Meal	Pass Christian Feed Store, Pass Christian

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14922	6.87	6.35	6.18	7.72	7.51	28.58	27.81
14923	6.79	6.33	6.18	7.70	7.51	28.49	27.81
14924	6.86	6.01	6.18	7.31	7.51	27.05	27.81
14925	6.51	7.03	6.18	8.55	7.51	31.64	27.81
14926	7.02	6.89	6.18	8.38	7.51	31.01	27.81
14927	7.08	6.84	6.18	8.32	7.51	30.78	27.81
14928	6.90	6.71	6.18	8.16	7.51	30.20	27.81
14929	7.03	6.96	6.18	8.46	7.51	31.32	27.81
14930	6.55	6.69	6.18	8.13	7.51	30.11	27.81
14931	7.17	6.88	6.18	8.36	7.51	30.96	27.81
14932	7.64	6.37	6.18	7.74	7.51	28.67	27.81
14933	7.53	6.58	6.18	8.00	7.51	29.61	27.81
14934	7.53	6.51	6.18	7.91	7.51	29.30	27.81
14935	7.95	6.49	6.18	7.89	7.51	29.21	27.81
14936	8.05	6.55	6.18	7.96	7.51	29.48	27.81
14937	7.38	6.93	6.18	8.43	7.51	31.19	27.81
14938	7.34	6.99	6.18	8.50	7.51	31.46	27.81
14939	7.21	6.85	6.18	8.33	7.51	30.83	27.81
14940	7.27	6.93	6.18	8.43	7.51	31.19	27.81
13923	7.57	6.54	6.18	7.95	7.51	29.43	27.81
14941	8.29	6.89	6.18	8.38	7.51	31.01	27.81
14942	8.55	6.90	6.18	8.39	7.51	31.05	27.81
14943	8.56	6.61	6.20	8.04	7.54	29.75	27.90
14944	8.08	6.64	6.18	8.07	7.51	29.88	27.81
14945	7.07	6.62	6.18	8.05	7.51	29.79	27.81
14946	8.20	6.77	6.18	8.23	7.51	30.47	27.81
14947	8.86	6.39	6.18	7.77	7.51	28.76	27.81
14948	8.80	6.09	6.18	7.40	7.51	27.41	27.81
14949	8.06	6.48	6.18	7.88	7.51	29.16	27.81
14950	7.79	6.47	6.18	7.87	7.51	29.12	27.81
14951	7.60	6.49	6.18	7.80	7.51	29.21	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	GLEN ALLAN OIL MILL, Glen Allan, Miss.	
14952	H. G. Cottonseed Meal.....	Glen Allan Oil Mill, Glen Allan.....
	B. F. GLOVER & SON COM. CO., New Orleans, La.	
14953	H. G. Cottonseed Meal.....	D. Carver Merc. Co., Bay St. Louis....
14954	H. G. Cottonseed Meal.....	D. Carver Merc. Co., Bay St. Louis....
	GRENADA OIL MILL, Grenada, Miss.	
14955	H. G. Cottonseed Meal.....	Newberger Merc. Co., Coffeeville.....
14956	H. G. Cottonseed Meal.....	Farmers Warehouse Co., Coffeeville....
14957	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
14958	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
14959	H. G. Cottonseed Meal.....	F. S. Leavill, Oxford.....
14960	H. G. Cottonseed Meal.....	Merchants Grocery Co., Water Valley.....
	HAZLEHURST OIL MILL & FERTILIZER COMPANY, Hazlehurst, Miss.	
14961	H. G. Cottonseed Meal.....	W. L. Robinson Co., Liberty.....
14962	H. G. Cottonseed Meal.....	C. F. Nelson & Sons, Goodman.....
14963	H. G. Cottonseed Meal.....	Denman Alford Co., McComb.....
14964	H. G. Cottonseed Meal.....	C. F. Nelson & Sons, Goodman.....
14965	H. G. Cottonseed Meal.....	Osyka Supply Co., Osyka.....
14966	H. G. Cottonseed Meal.....	Bolian Merc. Co., Bogue Chitto.....
14967	H. G. Cottonseed Meal.....	Denman Alford Co., McComb.....
14968	H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst.....
14969	H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst.....
13831	H. G. Cottonseed Meal.....	Bolian Merc. Co., Bogue Chitto.....
	HILL CITY OIL WORKS, Vicksburg, Miss.	
14970	H. G. Cottonseed Meal.....	Quitman Merc. Co., Quitman.....
14971	H. G. Cottonseed Meal.....	Mahned Lumber Co., Mahned.....
14972	H. G. Cottonseed Meal.....	Perkins & Co., Brooklyn.....
14973	H. G. Cottonseed Meal.....	Smith & Co., Carriere.....
14974	H. G. Cottonseed Meal.....	Hill City Oil Works, Vicksburg.....
14975	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg.....
14976	S. G. Cottonseed Meal.....	R. L. Crook & Co., Vicksburg.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14952	7.08	6.35	6.18	7.72	7.51	28.58	27.81
14953	8.06	6.28	6.18	7.64	7.51	28.60	27.81
14954	8.75	6.10	6.18	7.42	7.51	27.45	27.81
14955	9.36	6.31	6.18	7.67	7.51	28.40	27.81
14956	8.80	6.53	6.18	7.94	7.51	29.39	27.81
14957	8.18	7.11	6.18	8.64	7.51	32.00	27.81
14958	8.37	6.86	6.18	8.34	7.51	30.87	27.81
14959	8.88	6.55	6.18	7.96	7.51	29.48	27.81
14960	9.26	6.24	6.18	7.59	7.51	28.08	27.81
14961	6.76	7.28	6.20	8.85	7.54	32.76	27.90
14962	7.31	7.23	6.20	8.79	7.54	32.54	27.90
14963	7.02	7.42	6.20	9.02	7.54	33.39	27.90
14964	7.44	6.95	6.20	8.45	7.54	31.28	27.90
14965	6.63	7.44	6.20	9.05	7.54	33.48	27.90
14966	5.41	7.47	6.20	9.08	7.54	33.62	27.90
14967	6.74	7.18	6.20	8.73	7.54	32.31	27.90
14968	6.90	7.26	6.20	8.83	7.54	32.67	27.90
14969	5.91	7.26	6.20	8.83	7.54	32.67	27.90
13831	7.76	7.53	6.20	9.15	7.54	33.89	27.90
14970	8.09	6.74	6.18	8.19	7.51	30.33	27.81
14971	8.19	6.28	6.18	7.64	7.51	28.26	27.81
14972	8.64	6.47	6.18	7.87	7.51	29.12	27.81
14973	8.53	6.30	6.18	7.66	7.51	28.35	27.81
14974	9.12	6.11	6.18	7.43	7.51	27.50	27.81
14975	7.67	6.23	6.18	7.57	7.51	28.04	27.81
14976	9.45	5.76	4.95	7.00	6.02	25.92	22.28

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	HOLLANDALE COTTON OIL CO., Hollandale, Miss.	
14977	H. G. Cottonseed Meal.....	The Lampton Co., Columbia.....
14978	H. G. Cottonseed Meal.....	The Lampton Co., Columbia.....
14979	H. G. Cottonseed Meal.....	Goss & Wilkes, Columbia.....
14980	H. G. Cottonseed Meal.....	J. K. Henly, Biloxi.....
14981	S. G. Cottonseed Meal.....	Hollandale Cotton Oil Co., Hollandale.....
14982	S. G. Cottonseed Meal.....	Farmers Warehouse Co., Mathiston.....
14983	S. G. Cottonseed Meal.....	Threefoot Bros. & Co., Meridian.....
	HOUSTON COTTON OIL CO., Houston, Miss.	
14984	S. G. Cottonseed Meal.....	Houston Ice & Coal Co., Houston.....
14985	S. G. Cottonseed Meal.....	Houston Cotton Oil Company, Houston.....
14986	S. G. Cottonseed Meal.....	Houston Cotton Oil Company, Houston.....
	IMPERIAL COTTON OIL CO., Macon, Miss.	
14987	H. G. Cottonseed Meal.....	P. W. McMorries, Brooksville.....
14988	H. G. Cottonseed Meal.....	L. C. Smith, Lauderdale.....
14989	H. G. Cottonseed Meal.....	Imperial Cotton Oil Co., Macon.....
13924	H. G. Cottonseed Meal.....	J. D. Gully, Lauderdale.....
	INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss.	
14990	H. G. Cottonseed Meal.....	Independent Oil & Fertilizer Works, Columbus.....
14991	H. G. Cottonseed Meal.....	Independent Oil & Fertilizer Works, Columbus.....
	INDIANOLA COTTON OIL COMPANY Indianola, Miss.	
14992	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola.....
14993	H. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola.....
	ITTA BENA COTTON OIL CO., Itta Bena, Miss.	
14994	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena.....
	JACKSON FERTILIZER COMPANY, Jackson, Miss.	
14995	H. G. Cottonseed Meal.....	Wm. Atkinson & McDonald Co., Wes'n

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14977	8.28	6.22	6.18	7.56	7.51	27.99	27.81
14978	7.85	6.21	6.18	7.55	7.51	27.95	27.81
14979	8.03	6.25	6.18	7.60	7.51	28.13	27.81
14980	7.40	6.33	6.18	7.79	7.51	28.49	27.81
14981	7.53	6.24	5.00	7.59	6.08	28.08	22.50
14982	7.59	6.20	5.00	7.54	6.08	27.90	22.50
14983	7.91	6.32	5.00	7.68	6.08	28.44	22.50
14984	7.14	7.15	4.95	8.69	6.02	32.18	22.28
14985	6.85	7.10	4.95	8.63	6.02	31.95	22.28
14986	5.98	7.29	4.95	8.86	6.02	32.81	22.28
14987	6.86	6.22	6.18	7.56	7.51	27.99	27.81
14988	7.66	6.49	6.18	7.89	7.51	29.21	27.81
14989	6.56	6.19	6.18	7.53	7.51	27.86	27.81
13924	6.91	6.88	6.18	8.36	7.51	30.96	27.81
14990	8.11	6.66	6.18	8.10	7.51	29.97	27.81
14991	8.50	6.49	6.18	7.89	7.51	29.21	27.81
14992	5.89	6.94	6.18	8.44	7.51	31.23	27.81
14993	5.85	6.79	6.18	8.26	7.51	30.56	27.81
14994	6.30	6.49	6.18	7.89	7.51	29.21	27.81
14995	6.97	6.59	6.18	8.01	7.51	29.66	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
JACKSON OIL & REFINING CO., Jackson, Miss.		
14996	H. G. Cottonseed Meal	W. L. Dees, Crystal Springs
14997	H. G. Cottonseed Meal	Johnson-Woodward Co., Mt. Olive
14998	H. G. Cottonseed-Meal	Farmers Union Wse. Co., Pelahatchie
14999	H. G. Cottonseed Meal	C. W. Magee, Braxton
15000	H. G. Cottonseed Meal	Gaddis & Slay Co., Magee
15001	H. G. Cottonseed Meal	Jackson Oil & Refining Co., Jackson
15002	H. G. Cottonseed Meal	Farmers Warehouse Co., Pelahatchie
15003	H. G. Cottonseed Meal	Gaddis & Slay Co., Magee
15004	H. G. Cottonseed Meal	J. E. McNair, Lumberton
15005	H. G. Cottonseed Meal	Johnson-Woodward Co., Mt. Olive
15006	H. G. Cottonseed Meal	Hartman Merc. Co., Brookhaven
LAUREL OIL & FERTILIZER CO., Laurel, Miss.		
15007	H. G. Cottonseed Meal 6.56	E. B. Perry, Taylorsville
15008	H. G. Cottonseed Meal 6.56	Laurel Oil & Fertilizer Co., Laurel
15009	H. G. Cottonseed Meal 6.18	W. M. Hyde & Co., Poplarville
15010	H. G. Cottonseed Meal 6.18	J. F. Wilson, Philadelphia
15011	H. G. Cottonseed Meal 6.18	Croom & Story, Lucedale
15012	H. G. Cottonseed Meal 6.18	C. H. Stevens & Co., Richton
15013	H. G. Cottonseed Meal 6.18	E. B. Perry, Taylorsville
15014	H. G. Cottonseed Meal 6.18	S. G. Armstrong Merc. Co., Oakvale
15015	H. G. Cottonseed Meal 6.18	Farmers Warehouse Co., Ackerman
15016	H. G. Cottonseed Meal 6.18	T. E. Winn, Laurel
15017	H. G. Cottonseed Meal 6.18	W. A. Gunn, Noxapater
15018	H. G. Cottonseed Meal 6.18	Ovett Merc. Co., Ovett
15019	H. G. Cottonseed Meal 6.18	McLain - King Co., Bassfield
15020	H. G. Cottonseed Meal 6.18	Laurel Oil & Fertilizer Co., Laurel
15021	H. G. Cottonseed Meal 6.18	E. B. Perry, Taylorsville
LELAND OIL WORKS, Leland, Miss.		
15022	S. G. Cottonseed Meal	Loper Merc. Co., Lake
15023	S. G. Cottonseed Meal	Leland Oil Works, Leland
LEXINGTON COTTON OIL CO., Lexington, Miss.		
15024	S. G. Cottonseed Meal	Lexington Cotton Oil Co., Lexington
McINNIS & STURGIS, Meridian, Miss.		
15025	H. G. Cottonseed Meal	Parker Bros., Sandersville

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
14996	7.37	6.68	6.18	8.12	7.51	30.06	27.81
14997	7.45	6.91	6.18	8.40	7.51	31.10	27.81
14998	7.70	6.67	6.18	8.11	7.51	30.02	27.81
14999	5.02	7.00	6.18	8.51	7.51	31.50	27.81
15000	6.85	7.02	6.18	8.53	7.51	31.59	27.81
15001	7.75	6.77	6.18	8.23	7.51	30.47	27.81
15002	7.85	6.91	6.18	8.40	7.51	31.10	27.81
15003	7.00	7.20	6.18	8.75	7.51	32.40	27.81
15004	7.72	6.86	6.18	8.34	7.51	30.87	27.81
15005	7.26	7.22	6.18	8.78	7.51	32.49	27.81
15006	7.06	7.04	6.18	8.56	7.51	31.68	27.81
15007	7.10	7.00	6.56	8.51	7.98	31.50	29.52
15008	7.10	6.87	6.56	8.35	7.98	30.92	29.52
15009	7.43	6.31	6.18	7.67	7.51	28.40	27.61
15010	6.95	6.83	6.18	8.30	7.51	30.74	27.81
15011	7.50	6.33	6.18	7.70	7.51	28.49	27.81
15012	8.36	6.35	6.18	7.72	7.51	28.58	27.81
15013	7.71	6.62	6.18	8.05	7.51	29.79	27.81
15014	8.41	6.80	6.18	8.27	7.51	30.60	27.81
15015	7.10	6.70	6.18	8.15	7.51	30.15	27.81
15016	8.00	6.74	6.18	8.19	7.51	30.33	27.81
15017	7.92	6.79	6.18	8.26	7.51	30.56	27.81
15018	7.67	6.52	6.18	7.93	7.51	29.34	27.81
15019	9.00	6.53	6.18	7.94	7.51	29.39	27.81
15020	7.25	6.55	6.18	7.96	7.51	29.48	27.81
15021	7.65	6.38	6.18	7.76	7.51	28.71	27.81
15022	7.27	6.58	4.95	8.00	6.02	29.61	22.28
15023	7.18	6.25	4.95	7.60	6.02	28.13	22.28
15024	7.60	6.71	4.95	8.16	6.02	30.20	22.28
15025	7.20	6.73	6.18	8.18	7.51	30.29	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
MERIDIAN FERT. FACTORY, Meridian, Miss.		
15026	H. G. Golden Rod C-S. Meal	J. N. Tabor, Louisville
15027	H. G. Golden Rod C-S. Meal	J. O. Tabor, Jr., Louisville
15028	H. G. Golden Rod C-S. Meal	C. H. Stevens & Co., Richton
15029	H. G. Golden Rod C-S. Meal	C. H. Stevens & Co., Richton
15030	H. G. Golden Rod C-S. Meal	J. N. Tabor, Louisville
15031	H. G. Golden Rod C-S. Meal	O. Hopkins, Hickory
15032	H. G. Golden Rod C-S. Meal	H. H. Little Co., Mize
15033	H. G. Cottonseed Meal	G. Lowenberg, McCool
15034	H. G. Cottonseed Meal	W. H. Turner, Vossburg
15035	H. G. Cottonseed Meal	W. A. Rosenbaum, DeKalb
15036	H. G. Cottonseed Meal	Smythe Bros., Lake
15037	H. G. Cottonseed Meal	Mrs. R. J. Briggs, Jr., State Line
15038	H. G. Cottonseed Meal	Meridian Fertilizer Factory, Meridian
15039	H. G. Cottonseed Meal	Smythe Bros., Lake
15040	H. G. Cottonseed Meal	Lucedale Commercial Co., Lucedale
15041	H. G. Cottonseed Meal	H. N. Stuart & Sons, Morton
15042	H. G. Cottonseed Meal	J. E. Miller, Leaksville
15043	H. G. Cottonseed Meal	Loper Merc. Co., Lake
MAGNOLIA OIL MILL & M'F'G. CO., Magnolia, Miss.		
13586	H. G. Cottonseed Meal	Magnolia Oil Mill & M'f'g. Co., Magnolia
MINTER CITY OIL WORKS, Minter City, Miss.		
15044	H. G. Cottonseed Meal	Minter City Oil Works, Minter City
15045	H. G. Cottonseed Meal	Durant Ice & Coal Co., Durant
MISSISSIPPI COTTON OIL CO., Clarksdale, Miss.		
15046	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Clarksdale
15047	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Clarksdale
MISSISSIPPI COTTON OIL CO., Columbus, Miss.		
15048	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Columbus
13346	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Columbus

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15026	7.47	6.60	6.59	8.02	8.01	29.70	29.66
15027	6.90	6.73	6.59	8.18	8.01	30.29	29.66
15028	7.00	7.11	6.59	8.64	8.01	32.00	29.66
15029	6.92	6.98	6.59	8.49	8.01	31.41	29.66
15030	7.43	6.82	6.59	8.29	8.01	30.69	29.66
15031	8.35	6.61	6.59	8.04	8.01	29.75	29.66
15032	7.36	6.66	6.59	8.10	8.01	29.97	29.66
15033	7.90	6.20	6.18	7.54	7.51	27.90	27.81
15034	8.87	6.40	6.18	7.78	7.51	28.80	27.81
15035	8.12	6.35	6.18	7.72	7.51	28.58	27.81
15036	7.57	6.62	6.18	8.05	7.51	29.79	27.81
15037	7.65	6.56	6.18	7.98	7.51	29.52	27.81
15038	7.76	5.91	6.18	7.19	7.51	26.60	27.81
15039	7.22	6.55	6.18	7.96	7.51	29.48	27.81
15040	8.25	7.04	6.18	8.56	7.51	31.68	27.81
15041	7.05	6.52	6.18	7.93	7.51	29.34	27.81
15042	8.10	6.42	6.18	7.81	7.51	28.89	27.81
15043	7.77	6.32	6.18	7.68	7.51	28.44	27.81
13586	8.85	7.11	6.18	8.64	7.51	32.00	27.81
15044	8.05	6.63	6.19	8.06	7.53	29.84	27.86
15045	7.95	6.45	6.19	7.84	7.53	29.03	27.86
15046	8.35	6.51	6.18	7.91	7.51	29.30	27.81
15047	7.87	6.35	6.18	7.72	7.51	28.58	27.81
15048	8.55	6.49	6.18	7.89	7.51	29.21	27.81
13346	8.53	6.45	6.18	7.84	7.51	29.03	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
MISSISSIPPI COTTON OIL CO., Grenada, Miss.		
15049	H. G. Cottonseed Meal.....	Durant Ice & Coal Co., Durant.....
15050	H. G. Cottonseed Meal.....	Batesville Gin Co., Batesville.....
15051	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Grenada....
15052	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Grenada....
MISSISSIPPI COTTON OIL CO., Greenville, Miss.		
15053	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Greenville
MISSISSIPPI COTTON OIL CO., Jackson, Miss.		
15054	H. G. Cottonseed Meal.....	Bolian Merc. Co., Bogue Chitto.....
15055	H. G. Cottonseed Meal.....	Lampton & Rawls Co., Mt. Olive.....
15056	H. G. Cottonseed Meal.....	W. M. Biglane, Collins.....
15057	H. G. Cottonseed Meal.....	McHenry Trading Co., McHenry.....
15058	H. G. Cottonseed Meal.....	Champion Lumber Co., Orrisbry.....
15059	H. G. Cottonseed Meal.....	Z. Wardlaw, Utica.....
15060	H. G. Cottonseed Meal.....	The Cooke Co., Mendenhall.....
15061	H. G. Cottonseed Meal.....	C. W. McLeod, Mendenhall.....
15062	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
15063	H. G. Cottonseed Meal.....	Sumrall Merc. Co., Sumrall.....
15064	H. G. Cottonseed Meal.....	J. W. Shuttles & Son, Brooklyn.....
15065	H. G. Cottonseed Meal.....	Gaddis, McLaurin & Greaves, Clinton.....
15066	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Jackson....
15067	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg.....
15068	H. G. Cottonseed Meal.....	R. Watts & Company, Seminary.....
15069	H. G. Cottonseed Meal.....	Gallaspy Bros. & Company, Union.....
15070	H. G. Cottonseed Meal.....	J. D. Ray, Kosciusko.....
15071	H. G. Cottonseed Meal.....	The Lampton & Rawls Co., Mt. Olive.....
MISSISSIPPI COTTON OIL CO., Meridian, Miss.		
15072	H. G. Cottonseed Meal.....	Johnson-Hand Co., Ellisville.....
15073	H. G. Cottonseed Meal.....	State Line Merc. Co., State Line.....
15074	H. G. Cottonseed Meal.....	J. E. McNair, Lumberton.....
15075	H. G. Cottonseed Meal.....	McInnis & Stevenson, Poplarville.....
15076	H. G. Cottonseed Meal.....	Biloxi Milling Company, Biloxi.....
15077	H. G. Cottonseed Meal.....	McLeod & Company, Purvis.....
15078	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Meridian....
15079	H. G. Cottonseed Meal.....	J. J. Gaines, Agent, Decatur.....
15080	H. G. Cottonseed Meal.....	M. G. Blackwell, McNeil.....
15081	H. G. Cottonseed Meal.....	Johnson-Hand Company, Ellisville.....
15082	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Meridian....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15049	8.66	6.11	6.18	7.43	7.51	27.50	27.81
15050	9.71	6.14	6.18	7.47	7.51	27.63	27.81
15051	8.55	6.33	6.18	7.70	7.51	28.49	27.81
15052	9.12	6.30	6.18	7.66	7.51	28.35	27.81
15053	6.75	6.35	6.18	7.72	7.51	28.58	27.81
15054	8.70	6.73	6.18	8.18	7.51	30.29	27.81
15055	7.30	6.86	6.18	8.34	7.51	30.87	27.81
15056	7.20	6.91	6.18	8.40	7.51	31.10	27.81
15057	8.32	6.52	6.18	7.93	7.51	29.34	27.81
15058	7.87	6.38	6.18	7.76	7.51	28.71	27.81
15059	7.82	6.79	6.18	8.26	7.51	30.56	27.81
15060	7.22	6.47	6.18	7.87	7.51	29.12	27.81
15061	6.92	6.36	6.18	7.73	7.51	28.62	27.81
15062	7.78	6.31	6.18	7.67	7.51	28.40	27.81
15063	7.00	6.45	6.18	7.84	7.51	29.03	27.81
15064	7.87	6.32	6.18	7.68	7.51	28.44	27.81
15065	8.20	6.63	6.18	8.06	7.51	29.84	27.81
15066	8.00	6.27	6.18	7.62	7.51	28.22	27.81
15067	8.17	6.68	6.18	8.12	7.51	30.06	27.81
15068	8.40	5.99	6.18	7.28	7.51	26.96	27.81
15069	7.06	6.86	6.18	8.34	7.51	30.87	27.81
15070	8.14	5.97	6.18	7.26	7.51	26.87	27.81
15071	8.20	6.65	6.18	8.09	7.51	29.93	27.81
15072	10.11	6.43	6.18	7.82	7.51	28.94	27.81
15073	9.62	6.33	6.18	7.70	7.51	28.49	27.81
15074	9.34	6.57	6.18	7.99	7.51	29.57	27.81
15075	9.61	6.61	6.18	8.04	7.51	29.75	27.81
15076	7.46	6.51	6.18	7.91	7.51	29.30	27.81
15077	10.20	6.20	6.18	7.54	7.51	27.90	27.81
15078	9.75	6.14	6.18	7.47	7.51	27.63	27.81
15079	9.18	6.01	6.18	7.31	7.51	27.05	27.81
15080	9.86	6.22	6.18	7.56	7.51	27.99	27.81
15081	9.55	6.10	6.18	7.42	7.51	27.45	27.81
15082	9.66	6.10	6.18	7.42	7.51	27.45	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
MISSISSIPPI COTTON OIL CO., Natchez, Miss.		
15083	H. G. Cottonseed Meal.....	G. P. McGehee, Gloster.....
15084	H. G. Cottonseed Meal.....	Fatum & McLain, Gloster.....
13914	H. G. Cottonseed Meal.....	Fatum & McLain, Gloster.....
MISSISSIPPI COTTON OIL CO., West Point, Miss.		
15085	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., West Point
15086	H. G. Cottonseed Meal.....	Sam Jones, McCool.....
15087	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., West Point
15088	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., West Point
15089	H. G. Cottonseed Meal.....	J. S. Jones, McCool.....
15090	H. G. Cottonseed Meal.....	J. E. Cobb & Son, Weir.....
MISSISSIPPI COTTON OIL CO., Yazoo City, Miss.		
15091	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Yazoo City
15092	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Yazoo City
15093	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Yazoo City
NATCHEZ OIL COMPANY, Natchez, Miss.		
15095	H. G. Cottonseed Meal.....	Hattiesburg Grocery Co., Hattiesburg
15096	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
15097	H. G. Cottonseed Meal.....	W. M. Hyde & Co., Poplarville.....
15098	H. G. Cottonseed Meal.....	Natchez Oil Company, Natchez.....
15099	H. G. Cottonseed Meal.....	Rufin Merc. Co., Ellisville.....
15100	H. G. Cottonseed Meal.....	T. E. Winn, Laurel.....
NEWTON OIL & M'FG. CO., Newton, Miss.		
15101	H. G. Cottonseed Meal.....	F. L. White, Agent, Philadelphia.....
15102	H. G. Cottonseed Meal.....	Farmers Warehouse Co., Ackerman...
15103	H. G. Cottonseed Meal.....	Farmers Union Warehouse Co., Forest
15104	H. G. Cottonseed Meal.....	Sam Crow, Agent, Louisville.....
15105	H. G. Cottonseed Meal.....	Newton Oil & M'fg. Co., Newton.....
15106	H. G. Cottonseed Meal.....	S. S. Myers, Pelahatchie.....
15107	H. G. Cottonseed Meal.....	Newton Oil & M'fg. Co., Newton.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15083	7.27	6.42	6.18	7.81	7.51	28.89	27.81
15084	7.72	6.61	6.18	8.04	7.51	29.75	27.81
13914	8.78	6.73	6.18	8.18	7.51	30.29	27.81
15085	8.40	6.65	6.18	8.09	7.51	29.93	27.81
15086	9.35	6.86	6.18	8.34	7.51	30.87	27.81
15087	8.41	6.20	6.18	7.54	7.51	27.90	27.81
15088	8.67	6.47	6.18	7.87	7.51	29.12	27.81
15089	8.69	6.25	6.18	7.60	7.51	28.13	27.81
15090	7.58	6.88	6.18	8.36	7.51	30.96	27.81
15091	7.67	6.30	6.18	7.66	7.51	28.35	27.81
15092	7.76	6.44	6.18	7.83	7.51	28.98	27.81
15093	8.10	6.53	6.18	7.94	7.51	29.39	27.81
15095	6.90	6.53	6.18	7.94	7.51	29.39	27.81
15096	6.72	6.53	6.18	7.94	7.51	29.39	27.81
15097	6.55	6.70	6.18	8.15	7.51	30.15	27.81
15098	7.99	6.54	6.18	7.95	7.51	29.43	27.81
15099	6.90	6.06	6.18	7.37	7.51	27.27	27.81
15100	6.90	6.69	6.18	8.13	7.51	30.11	27.81
15101	7.70	6.18	6.18	7.51	7.51	27.81	27.81
15102	7.12	6.38	6.18	7.76	7.51	28.71	27.81
15103	8.34	6.72	6.18	8.17	7.51	30.24	27.81
15104	8.65	5.69	6.18	6.92	7.51	25.61	27.81
15105	8.41	6.60	6.18	8.02	7.51	29.70	27.81
15106	8.39	5.98	6.18	7.27	7.51	26.91	27.81
15107	8.35	6.75	6.18	8.21	7.51	30.38	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	NORTH MISSISSIPPI OIL MILLS, Holly Springs, Miss.	
15108	H. G. Cottonseed Meal.....	North Miss. Oil Mills, Holly Springs....
15109	H. G. Cottonseed Meal.....	North Miss. Oil Mills, Holly Springs....
	OKOLONA OIL COMPANY, Okolona, Miss.	
15110	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
13825	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
	OXFORD OIL MILL COMPANY, Oxford, Miss.	
15111	H. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
15112	H. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
15113	H. G. Cottonseed Meal.....	Brennen & McCharen, Oxford.....
15114	S. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
	PEOPLES' COTTON OIL & FIBER COMPANY, North Carrollton, Miss.	
15115	S. G. Cottonseed Meal.....	Peoples' Cotton Oil & Fiber Co., North Carrollton.....
	PEOPLES' OIL MILL & FERTILIZER WORKS, Aberdeen, Miss.	
15116	H. G. Cottonseed Meal.....	Tubb Bros. Co., Amory.....
15117	H. G. Cottonseed Meal.....	Sam Jones, McCool.....
15118	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Works, Aberdeen.....
15119	H. G. Cottonseed Meal.....	Peoples' Oil Mill & Fert. Works, Aberdeen.....
15120	H. G. Cottonseed Meal.....	F. D. Carter & Co., Aberdeen.....
	PHOENIX COTTON OIL COMPANY, Como, Miss.	
15121	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
15122	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
	PLANTERS GIN & OIL COMPANY, Baldwyn, Miss.	
15123	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15108	5.49	7.41	6.18	9.01	7.51	33.35	27.81
15109	6.60	7.35	6.18	8.94	7.51	33.08	27.81
15110	9.07	6.30	6.18	7.66	7.51	28.35	27.81
13825	7.83	7.28	6.18	8.85	7.51	32.76	27.81
15111	7.75	7.02	6.18	8.53	7.51	31.59	27.81
15112	7.30	6.75	6.18	8.21	7.51	30.38	27.81
15113	7.02	6.96	6.18	8.46	7.51	31.32	27.81
15114	7.09	6.51	4.95	7.91	6.02	29.30	22.28
15115	7.04	6.73	5.40	8.18	6.57	30.29	24.30
15116	7.67	6.71	6.18	8.16	7.51	30.20	27.81
15117	7.36	6.84	6.18	8.32	7.51	30.78	27.81
15118	7.95	6.79	6.18	8.26	7.51	30.56	27.81
15119	6.71	6.86	6.18	8.34	7.51	30.87	27.81
15120	7.45	6.90	6.18	8.39	7.51	31.05	27.81
15121	8.07	6.37	6.18	7.74	7.51	28.67	27.81
15122	8.12	6.33	6.18	7.70	7.51	28.49	27.81
15123	7.60	6.83	6.18	8.30	7.51	30.74	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
PLANTERS OIL MILL & GIN CO., Kosciusko, Miss.		
15124	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
15125	H. G. Cottonseed Meal.....	O. L. Shaw, Ackerman.....
15126	H. G. Cottonseed Meal.....	J. G. Irving, Weir.....
15127	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
15128	H. G. Cottonseed Meal.....	J. T. Cummins, Longview.....
15129	H. G. Cottonseed Meal.....	Triplett & Sons, McCool.....
15130	H. G. Cottonseed Meal.....	J. G. Irving, Weir.....
15131	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
PLANTERS OIL MILL & M'F'G. CO., Greenwood, Miss.		
15132	H. G. Cottonseed Meal.....	Buckley-Terry Co., Laurel.....
15133	H. G. Cottonseed Meal.....	The Hall Company, Laurel.....
15134	H. G. Cottonseed Meal.....	Farmers Warehouse Co., Charleston...
15135	H. G. Cottonseed Meal.....	Harpole & Marshall, Eupora.....
15136	H. G. Cottonseed Meal.....	J. L. Royals, Louin.....
15137	H. G. Cottonseed Meal.....	T. B. Gaddis, Morton.....
15138	H. G. Cottonseed Meal.....	W. W. Pigford, Lumberton.....
15139	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., Greenw'd
PLANTERS OIL MILL, Tunica, Miss.		
15140	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
15141	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
PLANTERS OIL WORKS, Clarksdale, Miss.		
15142	S. G. Cottonseed Meal.....	Planters Oil Works, Clarksdale.....
PONTOTOC COTTON OIL CO., Pontotoc, Miss.		
15143	H. G. Cottonseed Meal.....	Henderson-Molpus Co., Philadelphia
15144	H. G. Cottonseed Meal.....	Butler & Fife, New Albany.....
15145	H. G. Cottonseed Meal.....	Philadelphia Merc. Co., Philadelphia...
15146	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc...
15147	H. G. Cottonseed Meal.....	Mars Bros., Philadelphia.....
15148	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc...
15149	H. G. Cottonseed Meal.....	E. P. Donald & Sons, Philadelphia...
15150	H. G. Cottonseed Meal.....	Philadelphia Merc. Co., Philadelphia
PORT GIBSON OIL WORKS, Port Gibson, Miss.		
15151	S. G. Cottonseed Meal.....	Port Gibson Oil Works, Port Gibson....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton
15124	7.45	6.41	6.18	7.79	7.51	28.85	27.81
15125	8.40	6.69	6.18	8.13	7.51	30.11	27.81
15126	8.35	6.43	6.18	7.82	7.51	28.94	27.81
15127	7.90	6.08	6.18	7.39	7.51	27.36	27.81
15128	7.45	6.24	6.18	7.59	7.51	28.08	27.81
15129	7.50	6.74	6.18	8.19	7.51	30.33	27.81
15130	6.72	6.72	6.18	8.17	7.51	30.24	27.81
15131	7.51	6.23	6.18	7.57	7.51	28.04	27.81
15132	7.41	6.20	6.18	7.54	7.51	27.90	27.81
15133	7.06	6.06	6.18	7.37	7.51	27.27	27.81
15134	7.78	6.30	6.18	7.66	7.51	28.35	27.81
15135	7.40	6.28	6.18	7.64	7.51	28.26	27.81
15136	7.50	6.11	6.18	7.43	7.51	27.50	27.81
15137	7.29	6.18	6.18	7.51	7.51	27.81	27.81
15138	6.47	6.65	6.18	8.09	7.51	29.93	27.81
15139	7.39	6.33	6.18	7.70	7.51	28.49	27.81
15140	7.10	6.44	6.50	7.83	7.90	28.98	29.25
15141	7.20	6.53	6.50	7.94	7.90	29.39	29.25
15142	5.82	6.80	5.00	8.27	6.08	30.60	22.50
15143	6.67	7.13	6.18	8.67	7.51	32.09	27.81
15144	6.70	7.25	6.18	8.81	7.51	32.63	27.81
15145	6.58	7.15	6.18	8.69	7.51	32.18	27.81
15146	6.96	7.25	6.18	8.81	7.51	32.63	27.81
15147	7.10	7.32	6.18	8.90	7.51	32.94	27.81
15148	6.42	7.18	6.18	8.73	7.51	32.31	27.81
15149	7.15	7.08	6.18	8.61	7.51	31.86	27.81
15150	7.63	7.23	6.18	8.79	7.51	32.54	27.81
15151	8.13	5.60	5.00	6.81	6.08	25.20	22.50

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
PRODUCERS COTTON OIL CO., Yazoo City, Miss.		
15152	H. G. Cottonseed Meal.....	Lotterhos & Huber Co., Crystal Sp'gs
15153	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
15154	H. G. Cottonseed Meal.....	Johnson-Woodward Co., Mt. Olive...
15155	H. G. Cottonseed Meal.....	McInnis & Stevenson, Poplarville.....
15156	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
15157	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
15158	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg...
15159	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
15160	H. G. Cottonseed Meal.....	J. R. Gallaspy, Crystal Springs.....
13832	H. G. Cottonseed Meal.....	Bolian Merc. Co., Bogue Chitto.....
THE REFUGE COTTON OIL CO., Columbus, Miss.		
15161	H. G. Cottonseed Meal.....	The Refuge Cotton Oil Co., Columbus
15162	H. G. Cottonseed Meal.....	The Refuge Cotton Oil Co., Columbus
REFUGE COTTON OIL COMPANY, Greenville, Miss.		
15163	H. G. Cottonseed Meal.....	Gulfport Grocery Co., Gulfport.....
15164	H. G. Cottonseed Meal.....	Refuge Cotton Oil Co., Greenville.....
REFUGE COTTON OIL COMPANY, Rosedale, Miss.		
15165	S. G. Cottonseed Meal.....	Refuge Cotton Oil Co., Rosedale.....
15167	S. G. Cottonseed Meal.....	Refuge Cotton Oil Co., Rosedale.....
REFUGE COTTON OIL COMPANY, Vicksburg, Miss.		
15166	S. G. Cottonseed Meal.....	Hanes & Hood, Vicksburg.....
ROLLING FORK OIL MILL, Rolling Fork, Miss.		
15168	S. G. Cottonseed Meal.....	Rolling Fork Oil Mill, Rolling Fork...
15169	S. G. Cottonseed Meal.....	P. P. Williams Co., Vicksburg.....
SARDIS OIL COMPANY, Sardis, Miss.		
15170	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
15171	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....
15172	H. G. Cottonseed Meal.....	Sardis Oil Co., Sardis.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15152	8.11	6.25	6.18	7.60	7.51	28.13	27.81
15153	7.68	6.53	6.18	7.94	7.51	29.39	27.81
15154	7.50	6.74	6.18	8.19	7.51	30.33	27.81
15155	7.90	6.29	6.18	7.65	7.51	28.31	27.81
15156	7.55	6.58	6.18	8.00	7.51	29.61	27.81
15157	8.60	6.27	6.18	7.62	7.51	28.22	27.81
15158	8.42	6.19	6.18	7.53	7.51	27.86	27.81
15159	7.60	6.04	6.18	7.34	7.51	27.18	27.81
15160	6.99	6.32	6.18	7.68	7.51	28.44	27.81
13832	8.84	6.08	6.18	7.39	7.51	27.36	27.81
15161	6.34	6.73	6.18	8.18	7.51	30.29	27.81
15162	7.57	6.03	6.18	7.33	7.51	27.14	27.81
15163	8.17	6.26	6.18	7.61	7.51	28.17	27.81
15164	7.75	6.23	6.18	7.57	7.51	28.04	27.81
15165	6.92	6.35	4.95	7.72	6.02	28.58	22.28
15167	6.98	6.56	4.35	7.98	6.02	29.52	22.28
15166	6.86	6.44	4.95	7.83	6.02	28.98	22.28
15168	6.42	6.52	5.00	7.93	6.08	29.34	22.50
15169	6.65	6.52	5.00	7.93	6.08	29.34	22.50
15170	6.06	7.39	6.20	8.98	7.54	33.26	27.90
15171	5.59	7.36	6.20	8.95	7.54	33.12	27.90
15172	6.47	7.43	6.20	9.03	7.54	33.44	27.90

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
SENATOBIA OIL COMPANY, Senatobia, Miss.		
15173	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
15174	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
15175	H. G. Cottonseed Meal.....	Senatobia Oil Co., Senatobia.....
SHAW COTTON OIL COMPANY, Shaw, Miss.		
15176	S. G. Cottonseed Meal.....	Shaw Cotton Oil Co., Shaw.....
SHELBY OIL MILL, Shelby, Miss.		
15177	H. G. Cottonseed Meal.....	Shelby Oil Mill, Shelby.....
SHUBUTA OIL & M'F'G. CO., Shubuta, Miss.		
15178	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
15179	H. G. Cottonseed Meal.....	Shubuta Oil & M'f'g. Co., Shubuta....
SOUTHERN OIL & FERT. CO., Meridian, Miss.		
15180	H. G. Cottonseed Meal.....	L. L. Price, Toomsuba.....
15181	H. G. Cottonseed Meal.....	Southern Oil & Fertilizer Co., Meridian
15182	H. G. Cottonseed Meal.....	J. L. Long, Meridian.....
15183	H. G. Cottonseed Meal.....	T. F. Abney, Montrose.....
14213	H. G. Cottonseed Meal.....	Southern Oil & Fert. Co., Meridian....
STARKVILLE COTTON OIL CO., Starkville, Miss.		
15184	H. G. Cottonseed Meal.....	J. R. Gladney, Weir.....
15185	H. G. Cottonseed Meal.....	Starkville Cotton Oil Co., Starkville....
SULLIGENT COTTON OIL CO., Sulligent, Ala.		
15186	H. G. Cottonseed Meal.....	Gilmore & May Co., Amory.....
TATE BROS., Memphis, Tenn.		
15187	H. G. Cottonseed Meal.....	Butler & Fife, New Albany.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15173	9.30	6.72	6.18	8.17	7.51	30.24	27.81
15174	8.87	6.77	6.18	8.23	7.51	30.47	27.81
15175	8.50	6.80	6.18	8.27	7.51	30.60	27.81
15176	8.55	5.95	4.95	7.23	6.02	26.78	22.28
15177	7.85	6.26	6.18	7.61	7.51	28.17	27.81
15178	7.00	6.99	6.18	8.50	7.51	31.46	27.81
15179	6.78	7.03	6.18	8.55	7.51	31.64	27.81
15180	8.15	6.93	6.18	8.43	7.51	31.19	27.81
15181	7.35	7.18	6.18	8.73	7.51	32.31	27.81
15182	7.47	6.66	6.18	8.10	7.51	29.97	27.81
15183	7.55	6.49	6.18	7.89	7.51	29.21	27.81
14213	7.93	7.22	6.18	8.78	7.51	32.49	27.81
15184	7.60	6.61	6.18	8.04	7.51	29.75	27.81
15185	7.95	6.35	6.18	7.72	7.51	28.58	27.81
15186	7.65	6.84	6.18	8.32	7.51	30.78	27.81
15187	7.95	6.36	6.18	7.73	7.51	28.62	27.81

Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	HOLLYWOOD OIL MILL, Hollywood, Miss.	
15188	H. G. Cottonseed Meal	Hollywood Oil Mill, Hollywood ..
	TENNESSEE COTTON OIL CO., Memphis, Tenn.	
15189	H. G. Cottonseed Meal	McCullar & Co., Booneville
	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	
15190	H. G. Cottonseed Meal	Tupelo Oil & Ice Co., Tupelo
15191	H. G. Cottonseed Meal	Tupelo Oil & Ice Co., Tupelo
	J. LINDSAY WELLS COMPANY, Memphis, Tenn.	
15192	S. G. Sunny South C-S. Meal ..	Merchants Grocery Co., Water Valley ..
15193	S. G. Sunny South C-S. Meal ..	Buckley-Terry Co., Laurel
15194	S. G. Sunny South C-S. Meal ..	W. A. McDonald, Bay St. Louis
15195	S. G. Sunny South C-S. Meal ..	Skillman Bros., Corinth
15265	S. G. Sunny South C-S. Meal ..	C. E. Beer, Vicksburg
14476	H. G. Star Cottonseed Meal	T. J. Cole & Co., Ripley
	WESSON COTTON OIL & FERTILIZER COMPANY, Wesson, Miss.	
15196	H. G. Cottonseed Meal	Ginn & McDonald Co., Tylertown
15197	H. G. Cottonseed Meal	Wesson Cotton Oil & Fert. Co., Wesson ..
15198	H. G. Cottonseed Meal	Wesson Cotton Oil & Fert. Co., Wesson ..
	WINONA OIL & M'FG. COMPANY, Winona, Miss.	
15199	H. G. Cottonseed Meal	G. M. Armstrong, Coffeeville
15200	H. G. Cottonseed Meal	Winona Oil & M'fg. Co., Winona
15201	H. G. Cottonseed Meal	Winona Oil & M'fg. Co., Winona

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Nitrogen—Per Cent. Found.	Nitrogen—Per Cent. Guaranteed.	Ammonia—equivalent of Nitrogen—Found.	Ammonia—equivalent of Nitrogen—Guaranteed.	Value of Nitrogen Found Per Ton.	Value of Nitrogen Guaranteed Per Ton.
15188	7.90	6.38	6.18	7.76	7.51	28.71	27.81
15189	8.77	6.23	6.18	7.57	7.51	28.04	27.81
15190	7.78	6.66	6.60	8.10	8.02	29.97	29.70
15191	8.91	6.64	6.60	8.07	8.02	29.88	29.70
15192	7.78	3.29	4.95	4.00	6.02	14.81	22.28
15193	7.65	3.52	4.95	4.28	6.02	15.84	22.28
15194	9.02	3.32	4.95	4.04	6.02	14.94	22.28
15195	8.35	3.27	4.95	3.98	6.02	14.72	22.28
15265	10.06	3.04	4.95	3.70	6.02	13.68	22.28
14476	9.20	6.48	6.18	7.88	7.51	29.16	27.81
15196	3.80	7.07	6.18	8.60	7.51	31.82	27.81
15197	5.67	6.97	6.18	8.47	7.51	31.37	27.81
15198	6.46	7.07	6.18	8.60	7.51	31.82	27.81
15199	7.28	6.91	6.18	8.40	7.51	31.10	27.81
15200	7.35	6.69	6.18	8.13	7.51	30.11	27.81
15201	7.70	6.65	6.18	8.09	7.51	29.93	27.81

Mississippi Agricultural Experiment Station

Agricultural College, Mississippi

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BULLETIN No. 144.

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INSPECTION AND ANALYSES OF
COMMERCIAL FEEDING STUFFS
ON SALE IN THE STATE.



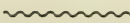
CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

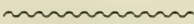
DECEMBER, 1910.



MISSISSIPPI FERTILIZER AND FEEDING  
STUFFS CONTROL.



*Inspection and Analyses of Feeding Stuffs*



|                      |                   |
|----------------------|-------------------|
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\*Absent on leave.



# INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS.

It is conservatively estimated that feeders in this state spend more than two and a half million dollars annually for ready mixed feeds and by-products which are subject to inspection under the law which became effective July 1, 1908. No record is kept of the amount and value sold yearly of corn chops, the whole grains, hays &c., which are not embraced by the law.

In view of the great economic importance of proper feeding, it would be difficult to over estimate the advantage which would follow a better understanding on the part of feeders generally of even the elementary principles which underlie the rational feeding of animals kept for various purposes. It is true, of course, that much yet remains to be learned concerning animal nutrition, but the immense amount of research of the most painstaking and accurate character which has been carried out has resulted in the recognition of certain broad principles which are of the highest practical value to the feeder, whose interest demands the maximum yield of productive labor from work stock, and of milk, flesh, etc., from other animals, in return for labor or money expended for feeds.

The lack of positive information in regard to all of the important aspects of animal nutrition is certainly not sufficient justification of the attitude of some so-called practical feeders who prefer rule-of-thumb methods, developed in practice under a given set of conditions and thought to be applicable generally, to the conclusions of equally practicable and impartial experimental studies of a scientific character.

The systems of state inspection of feeds which have been inaugurated during the last few years, besides largely suppressing adulteration and misbranding, have proven of the greatest advantage in bringing purchasers of feeds to inquire more carefully than ever before into their composition and the use which the animal body makes of the various nutrients contained in them. This effect of these laws is not one of their unimportant benefits. Reputable dealers and intelligent purchasers naturally wish to secure the best feeds for the price asked, and, as the value of a feeding stuff depends upon its adaptability, palatability, the amounts and digestibility of nutrients contained in it, both the seller and the buyer are interested in acquainting themselves with the chemical composition of the feeds offered to them by manufacturers and in obtaining as much knowledge as possible in regard

to the digestibility of their valuable components, as well as the palatability and adaptability in general of all kinds of feeds.

Manufacturers are taking an increasing interest in the preparation and intelligent marketing of their products, and competent and conscientious salesmen may greatly assist buyers in purchasing feeding stuffs on the proper basis and not merely by brand name or price. The increasing necessity for accurate information in regard to composition and value of feeds on the markets must result in a better business basis for the trade, and a brief elementary discussion of the nutrients in feeds and their function in nutrition is appropriate in these publications, giving the composition of all feeds sold in the state.

**Composition of feeding stuff.**—Considered chemically, feeds consist of a large number of compounds, but from the point of view of the feeder, all of these may be arranged in a few general groups which will be sufficient for the purpose of this brief discussion. The inspection of feeds in this state has been maintained for only a short time, but as the work and publication of results progresses, feeders and dealers in feeds generally must become more and more familiar with the terms in which the composition of a feed is expressed.

All feeding stuffs consist principally of compounds classified under the following heads:

**Water.**

**Ash.**

**Fat.**

**Protein.**

**Nitrogen-free Extract** (carbohydrates most largely).

**Fiber.**

The following typical analyses will illustrate the use of the above terms, as well as the variation in composition of some common feed materials:

|                                       | *CORN.  | COTTON SEED<br>MEAL. | COTTON SEED<br>HULLS. |
|---------------------------------------|---------|----------------------|-----------------------|
| Water.....                            | 10.60%  | 7.40%                | 10.50%                |
| Ash .....                             | 1.50%   | 6.20%                | 2.80%                 |
| Fat .....                             | 4.75%   | 8.00%                | 2.20%                 |
| Protein.....                          | 9.75%   | 42.30%               | 4.20%                 |
| Nitrogen-free extract (carbohydrates) | 71.20%  | 28.10%               | 34.00%                |
| Fiber .....                           | 2.20%   | 8.00%                | 46.30%                |
| Total .....                           | 100.00% | 100.00%              | 100.00%               |

\* Many samples of corn chops analyzed last season contained less than 3.50% of fat and not more than 8.75% protein.

In the case of corn, for example, the analysis given above means simply that 100 pounds of grain of average quality may be said to consist of 10.60 pounds of water (moisture), 1.50 pounds of ash, 4.75 pounds of fat (oil), 9.75 pounds of protein, 71.20 pounds of nitrogen-free extract (carbohydrates in Mississippi law), and 2.20 pounds of fiber.

**Dry Matter.**—All feeds contain moisture though some may appear to be quite dry. Air-dry hays and straws contain, say, 8 to 15 per cent and corn and oats approximately 10 to 12 per cent. Grains, hays, by-products etc., are never used really dry. They are **AIR-DRY**. The **DRY MATTER** in a feed is estimated by heating a known weight under proper conditions until **all** of the water or moisture passes off in vapor. The loss in weight is estimated as water and the remainder as dry matter.

**Organic matter.**—All plants, and consequently all substances used for feeding, contain varying proportions of ash which remains when the plant or feeding stuff is burned. The ash is taken from the soil, of course, during the life of the plant, and it is termed **INORGANIC MATTER**, while the part of the feed which actually burns is known as **ORGANIC MATTER**. If a sample of corn is found to carry ten per cent of water and 1.50 per cent of true ash (percentage of water and ash—11.50), it may be said to contain 88.50 per cent of organic matter (which can be burned away). The organic matter only is considered in chemical analyses made in the inspection of feeds.

**Relation of the composition of feed to that of the bodies of animals and animal products.**—From simpler substances in the atmosphere and in the soil, plants put together the compounds out of which their bodies are constructed. Animals, on the other hand, possess no ability, of course, of using any part of the air or soil as a food, and, consequently, the materials composing their bodies must come entirely through the plant world. Since this is true, it may be instructive in this connection to point out in the main how the composition of animal bodies differs from that of plants or feeding stuffs from which they are derived.

The bodies of plants from which our feeds are made are totally dissimilar to the substances in soil and air from which the plant secures its food, but the difference in composition between the bodies of animals and those of plants is by no means so distinct.

Animals and animal products are not made up of unvarying proportions of certain compounds, but some idea of the general differ-



ences in composition which exist between feeds, the bodies of animals, and milk and one of the most important of animal products may be obtained from analyses given below. These analyses possess no value except as illustrations of the most general character. While commercial feeds contain 8 to 12 per cent of water, animals usually more than 50 per cent, and average milk 87 per cent, the results which follow are expressed in terms of dry substance, i. e., after the evaporation of all the water.

|                                    | Composition<br>of a corn<br>and oat feed. | Composition<br>of solid Mat-<br>ter in Milk. | Composition<br>of a well<br>fed ox. |
|------------------------------------|-------------------------------------------|----------------------------------------------|-------------------------------------|
| Fat .....                          | 5.10%                                     | 30.23%                                       | 15.53%                              |
| Protein.....                       | 11.02%                                    | 24.81%                                       | 34.58%                              |
| *Carbohydrates .....               | 81.39%                                    | 39.54%                                       | 0.00†                               |
| Ash .....                          | 2.49%                                     | 5.42%                                        | 10.50%                              |
| Contents of stomach and intestines |                                           |                                              | 39.39%                              |
| Total .....                        | 100.00%                                   | 100.00%                                      | 100.00%                             |

**FAT** and **PROTEIN** are the distinctive ingredients of animals the fat often predominating, while the **CARBOHYDRATES** constitute the principle constituent of their rations. The solid matter in milk contains relatively large amounts of fat, protein and a carbohydrate (milk sugar). The proportions of fat, protein and carbohydrates (i. e., the nutrients) in feeds are decidedly different from those in animals and animal products.

How to supply most cheaply in proper amount, palatable and adaptable rations containing appropriate proportions of the nutrients **FAT**, **PROTEIN** and **CARBOHYDRATES** for various animals kept for various purposes under conditions sometimes widely different is a problem of no little complexity.

While it may be convenient from one point of view to regard farm animals as machines for converting the energy contained in feeds into useful work, as in the cases of horses, mules and oxen, or for using the nutrients in feeds for making beef, mutton, milk, etc., this analogy has its limitations, for animals are not machines merely. The well-established principles of nutrition must guide the feeder, that he may make no serious mistakes. That there are no recipes for the best

\* Nitrogen-free extract is expressed as "carbohydrates" in the Mississippi law. "Carbohydrates" in the corn and oat feed includes the fiber also.

† No account taken of small amount carbohydrates in animal bodies.



feed for a given animal is well recognized by those interested in feeding from the commercial as well as the scientific stand-point.

### FUNCTIONS OF FOOD.

Having fixed in mind the nutrients which are found in feeding stuff and also a general idea of the composition of animal bodies, it is appropriate to direct especial attention to the uses of food in general and the functions of the several classes of nutrient substances contained in them. The food serves:

- (1) For repairing waste, i. e., of the working parts.
- (2) For supplying material for growth or which are stored up for future use, or which may be converted into useful products, e. g., milk and eggs.
- (3) For supplying energy:
  - (a) Needed in the process of mastication, digestion, etc., i. e., in preparing and assimilating foods, etc.
  - (b) Required for the outward movement of the body e. g., in moving from place to place, or in performance of work in general.
  - (c) Consumed as heat. The body is constantly losing heat, of course, and the necessary supply must be kept up. When life ceases, it can no longer perform its functions, and the body cools.

**Repair of waste of working parts.**—The working parts of the body (muscles and lean flesh in general) consist most largely of **PROTEIN**. The true fat contains no protein whatever. The food must carry enough protein to maintain the machinery of the body in the best condition. When a muscle is in action it is being consumed and this waste of its substance can be supplied only from the protein in the feed, for *the animal has no power of building up protein bodies from those constituents of the feed which do not already contain proteins.*

When at hard work, the muscles have occasion for more repair material than when they are undergoing little movement, as when the animal is at rest, and, consequently work stock must be fed a ration richer in protein when they are working than during seasons of comparative rest. It naturally follows also that the harder the work the greater will be the demand for protein for waste repairing.

**Energy required by animals.**—Animals may be compared to motors, but a motor is simply a mechanism for converting some form of energy into work. They can do no work of themselves; steam and gasoline engines or motors must be supplied with heat by means of steam or burning gas, and a part of this heat is used by the motor for its operation in generating power. The electric motor requires electrical energy. Animals are forms of motors which are not understood, but we do know, of course, that they must derive their energy from their food. How this is converted into power is yet unexplained.

Energy is needed in the act of chewing, in standing, breathing, maintaining circulation of the blood, in digestion, etc. A horse, mule, or ox at hard work requires more food just as an engine uses more steam when carrying its load than when running idle.

Besides the energy used as already stated, the animal must have in its food a source of energy for conversion into heat for maintaining the temperature of the body at the proper point. Food is consumed (burned) in the body and produces heat by a process which is not wholly unlike the burning of coal or any kind of organic matter. Feeding stuffs will generate heat if burned outside of the body, and they are made to do this gradually when burned within it. A large animal will require the burning of more food to keep its body warm than a smaller animal, just as it requires more coal to heat a large than a small room. Moreover, more will be required, naturally, in cold than in warm weather, on account of more rapid radiation.

**Energy in feeds.**—Since the animal derives its energy from feeds, it should be pointed out that the amount of energy contained in feeding stuffs is very variable. It is important to remember also that **only** food that is **digested** can be drawn upon for energy supply. In addition to this it appears that the total energy in the **digested** portion of one kind of feed may be more fully used for maintaining the animal than the total energy in the digested portion of another kind of feed, that in the grains being more valuable than that of coarse fodders on account of the greater amount of energy consumed in the **actual digestion and assimilation** of the coarser materials\*.

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\* The subject of energy required by farm animals and the "net available" energy in various feeding stuffs is very clearly discussed by Armsby in Farmers' Bulletin No. 346, U. S. Dept. Agriculture. This bulletin explains the computation of rations by the use of energy values, and farmers and others interested in the subject of animal nutrition, should read this bulletin carefully. It is written in plain language.

See Armsby's Principles of Animal Nutrition, p. 435, and also "Feed as a Source of Energy" by Armsby, Bulletin 84 of Penn. Exp. Station.

So far as heat alone is concerned, a moment's reflection will make it plain that one pound of one kind of feed may supply more heat than a similar weight of another, just as one kind of coal or wood is more valuable for heating purposes than another. For example, it will be pointed out that the burning of one pound of **fat** will liberate over twice as much heat as the burning of one pound of starch, which is a chemical body of a totally different nature, but both occur in feeds in varying amounts.

**Summary.**—The foregoing paragraphs contain a brief discussion of the composition of the animal body which must be made up out of the chemical compounds of the feed. The nutrient substances of feeds, viz.: fat, protein, and carbohydrates have been mentioned and it is pointed out that animals consist most largely of protein and fat (lean flesh of protein almost entirely), while most feeds contain carbohydrates in larger amount than any other constituent (certain so-called protein feed, e. g., cottonseed meal, soja bean meal, etc., being exceptions).

The functions of food in a more general sense were briefly considered, these being the supply of waste of the working parts, of material for valuable products, as, e. g., milk and eggs, and for furnishing the energy for maintaining the animal and for keeping the body warm.

It now remains to explain more carefully the nature of the nutrients, fat, protein, and carbohydrates and the functions of these in repairing waste and supplying energy as well as material for building up the body or for the manufacture of animal products.

Finally we must consider the digestibility of feeds, the composition of various kinds, the making of rations, the purchase of commercial feeding stuffs, etc.

### THE NATURE OF THE COMPONENTS OF FEEDS.

**Fat.**—The fat in feeding stuffs requires no special discussion. It does not differ (i. e., the true fat) greatly from that in animals. Certain oil-bearing seeds contain large amounts (e. g., cottonseed, peanuts, flaxseed, etc.) but hays, grasses, and all kinds of seeds and of by-products used for feeding contain it.

Ordinary ether is an efficient solvent for all kinds of fats and oils, and their amount in feeds is estimated by a thorough extraction with ether in a special form of apparatus. But ether may dissolve also other substances, and, therefore, the "ether extract" is called "crude fat," or simply, and doubtless more properly, "ether extract."

The law now in force in Mississippi requires all feeds to be guaranteed to contain a minimum of 3.50 per cent of fat.



**Carbohydrates.**—This term refers to groups of nutrients in feeds of which starch and sugar are familiar examples. Corn, rice polish, wheat shorts, etc., are rich in starch, while the distinctly protein feeds contain much less. Cotton and other fibers are composed most largely of cellulose which is an important carbohydrate. The term is extended to include here certain compounds of feeds which, strictly speaking are not carbohydrates, but which possess value as nutrients.

**Carbohydrates in feeding stuff analyses.**—While the fibrous and woody parts of plants consist largely of cellulose, which is itself a true carbohydrate, the use of the term within the meaning of the Mississippi law refers only to the more digestible forms, such as starch and sugars, etc., bodies more appropriately designated collectively in chemical analysis as nitrogen-free extract.

**Crude Fiber.**—By provision of our law the fibrous and woody parts of feeds are set apart from the more easily digestible carbohydrates, and these are included under **CRUDE FIBER**.

Coarse fodders and grasses in general, cottonseed hulls, oat hulls, etc., contain large amounts of fiber, while the cereal grains and by-products containing no hulls carry comparatively small quantities.

The determination of the amount of fiber in a feed is important in ascertaining its general character. While it is well known, of course, that a certain amount of fibrous material is necessary for most animals, it should be remembered in buying feeds that the fiber in them is their cheapest and most indigestible constituent. Hays, cottonseed hulls etc., supply fiber cheaply. Mixed feeds that contain large percentages of fiber must, of necessity, contain a smaller total amount of the nutrients, fat, protein, and carbohydrates than those which carry small percentages of fiber.

The law in this state permits only 12 per cent of fiber, except in "Cow and Ox Feeds" which must consist in part of cottonseed or cottonseed by-products, and these must be branded **COW FEED, OX FEED OR COW AND OX FEED**.

**Protein.**—This is one of the predominating constituents of the animal body, as we have already seen, and, consequently, it becomes one of the essential ingredients of feeds, since it has been pointed out the protein of the body must have its origin solely in the protein of feeds.

The word, protein, is applied to important groups of compounds in feeds which contain nitrogen. It is not the name, therefore, of a single substance, nor is it used to denote all of the compounds in feeds of which nitrogen forms a part.



The true proteins differ from other nutrients in that most of them contain approximately 16 per cent of nitrogen. Dried lean flesh and dried whites of eggs, the casein of milk, etc., consist most largely of protein.

The cheap feeds cannot contain as much of this important constituent as those of better quality and higher price. Protein is one of the most expensive constituents of feeds, as it is also one of the most essential when feeding stuffs are to be bought for use on the farm.

Corn, and the cereal grains generally are rich in carbohydrates, and some material richer in protein should be fed with them. By-products such as cottonseed meal, brewers' and distillers' dried grains, gluten feeds, wheat bran and shorts, peavine, clover and alfalfa hays, etc., all contain protein in larger amounts than the grains and common hays and should be used with them, of course, in proper rations.

**Ash.**—The ash in feeds consists of substances drawn by the plants from the soil, and which remain in greater part after the feed is burned. The analysis on page 7 shows that the ash in the body of an ox may constitute as much as 10 per cent of the dry weight of the entire body. Most but not all of this ash is to be found naturally in the bones and teeth. While ash, in a proper sense, is an important nutrient, especially perhaps for growing animals, it is not considered usually in preparing rations, or buying feeds. It should be remembered, however, that the animal is entirely dependent on the ash elements in its food for material out of which its bones and teeth are to be constructed. The adequacy of ash ingredients of feeds has not been so thoroughly studied as that of other constituents. Some form of lime is often added to poultry feeds. Eggshells consist almost entirely of carbonate of lime.

### FUNCTIONS OF NUTRIENTS IN FEEDS.

**Function of fat and carbohydrates.**—These two nutrients in feeds serve similar purposes. From them the animal derives fat for its body and energy (including heat) for its life processes. Ordinary feeding stuffs contain comparatively small quantities of fat while carbohydrates form their predominating constituent (See analyses on page 17. As has been said, a unit weight of fat will supply over twice as much heat (energy) as a unit weight of, say, starch, one of the most important carbohydrates. All carbohydrates, however, supply less energy than the fats, weight for weight.

An animal at hard work must be liberally supplied with these two great sources of energy for conversion into the work required of it.

**THE CARBOHYDRATES OF FEEDS MAY BE CONVERTED INTO FAT IN THE BODY.**—A dairy cow may produce in her milk much more fat than she receives in her food, and the increase in weight in fattening steers is due most largely to the fat stored up in their bodies, i. e., fat is formed much more rapidly than lean flesh. This has been particularly observed also in fattening sheep and swine, the gain in fat amounting more than nine times that of protein.\*

**Functions of protein.**—The vegetable proteins in feeds are the sources of all animal proteins. The animal may employ vegetable fats, carbohydrates, and possibly proteins for the formation of body fats, but such transformations are not possible in the production of body proteins. This fact is sufficient justification of the importance which is attached to adequate amounts of protein in feeds, since we know that the skin, horn, hoof, hair and lean flesh which compose such a large proportion of the dry weight of animals consist most largely of proteins.

Successful rations must contain enough protein to keep the working parts of the body in vigorous condition. The demand increases rapidly when severe labor is required of a work animal. Dairy cows in good flow need a great deal of protein for the formation of casein of the milk. It would require, e. g., the digestible protein of almost 6½ pounds of wheat bran and of about 10 pounds of corn to supply the protein in 3 gallons of average milk, the additional protein required for the maintenance of the cow not being considered.

It may be added also that protein (like fat and carbohydrates) may be used by the animal for the production of energy. Since carbohydrate feeds are usually cheaper, the use of protein as a fuel substance in this respect is not an economic procedure, though the price of good cottonseed meal (which is very rich in protein) may sometimes justify the use in a ration of an amount of protein in excess of what is ordinarily regarded as sufficient and this excess may be used then for energy production. Pound for pound the proteins (though the sources of them vary) produce approximately as much energy as the carbohydrates..

**Summary.**—Summarizing briefly what has been said concerning feed nutrients, we may now state:

- (1) **THAT FAT AND CARBOHYDRATES** supply energy for the digestion and assimilation of food and the internal activities of the body, as well as the energy for the **outward activities**

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\* See Jordan, Feeding of Farm Animals, pp. 351, 361.

(work in moving the body, etc.). From these nutrients come most largely also the heat for maintaining the proper temperature.

- (2) That the carbohydrates (as well as the fat) in feed contribute to the formation of fat stored in the body or supplied in milk, and that the gain in weight of fattening animals is due most largely to gain in fat, most of this fat being formed from carbohydrates. Animals at hard labor instead of at rest require more carbohydrates and fat to supply the extra energy demanded by it. Dairy cows require (in addition to that necessary for maintenance) adequate amounts for the fat and carbohydrates in their milk,—the more milk, the more required. (See analysis of milk solids on page 7.)
- (3) That carbohydrates are the predominating constituents of rations.
- (4) **THAT THE PROTEINS IN FEED** are the sources of all proteins in the body, which itself consists in greater part, as a rule, of proteins (skin, muscular tissues, hair, horn, hoof, organic matter of the bones, etc.). Proteins are needed to repair waste. The more labor or the more milk, the more protein required. Finally protein may be used as a fuel, performing a function thereby reserved most largely for fat and carbohydrates in properly designed feeds, the proteins being very expensive constituents of feeds.

### DIGESTIBILITY OF FEEDS.

**Digestibility in general.**—It is obvious that the value to the animal of the nutrient is most largely measured by the ease and completeness of digestion. The nutrients in a given feed are not digested to an equal extent, and it is to be expected that feeds will vary markedly between themselves in point of the digestibility of the nutrient carried by them. The value of this in the purchase and use of feeding-stuffs is sufficiently apparent.

The difficulties in the way of accurate determinations of digestibility cannot be discussed here. The large amount of experimental work which has been done supplies data which, though not claimed to be exact, are nevertheless valuable guides to the feeder.

**Coefficients of digestion.**—If 80 per cent of the **dry matter** contained in 100 pounds of a given feed is found by careful experiments to be digested, the coefficient of digestibility of the dry matter of the feed



under the conditions of the experiment, is said to be 80 (i. e., 80 per cent digested). If 75 per cent of the proteins are digested, the digestion coefficient of the protein in the feed is said to be 70, etc., etc.

Ordinary digestion experiments supply little information in regard to the **work** required to accomplish it and the **net value** of digested nutrients may differ apparently in no small degree from the value indicated by total digestibility.

The digestible matter in feeds varies greatly, as stated above, and as the table of coefficients which follows will plainly show. The coarse fodders contain much less digestible matter than, e. g., the cereal grains and their by-products.

**Effect of Cooking, grinding, etc.,**—Some farmers appear to believe that cooking and steaming certain foods increases their digestibility, but the results of careful study and experiment fail to substantiate this belief which was formerly quite prevalent. Certain methods of treatment may affect in a desirable way the palatability of a feed or ration, but the digestibility of its nutrients is not modified greatly.

For some animals and feeds a saving may be accomplished by grinding, which assists in mastication, and prevents many whole grains from escaping digestion, besides destroying, in the case of some feeds, the vitality of weed seeds. Whether grinding will pay depends upon the conditions, and no special rule can be given.

TABLE I.—Digestion Coefficients.

| Number of Experiments. | KIND AND CONDITION OF FOOD. | Dry Matter. | Organic matter. | Protein. | Fiber. | N-free Ext. Carbohydrates. | Fat. |
|------------------------|-----------------------------|-------------|-----------------|----------|--------|----------------------------|------|
| GRAINS AND SEEDS.      |                             |             |                 |          |        |                            |      |
| 5                      | Corn meal .....             | 89.4        | 89.6            | 67.9     |        | 94.6                       | 92.1 |
| 2                      | Corn and cob meal .....     | 78.7        | 79.8            | 55.6     | 45.7   | 87.6                       | 84.1 |
| 39                     | Oats.....                   | 70.         |                 | 78.0     | 20.0   | 76.0                       | 83.0 |
| 2                      | Cottonseed .....            | 66.0        |                 | 68.0     | 76.0   | 50.0                       | 87.0 |
| 1                      | Soy-bean meal .....         | 81.9        | 84.0            | 91.0     | 71.2   | 76.3                       | 85.7 |
| 1                      | Pea meal.....               | 86.8        | 87.9            | 83.2     | 25.7   | 93.6                       | 54.5 |
|                        | Acorns.....                 |             | 88.0            | 83.0     | 62.0   | 91.0                       | 87.0 |
| BY-PRODUCTS.           |                             |             |                 |          |        |                            |      |
| 2                      | Corn cobs .....             | 51.4        |                 | 19.3     | 57.5   | 48-3                       |      |
| 7                      | Wheat bran .....            | 62.3        | 65.7            | 77.8     | 28.6   | 69.4                       | 68.  |
| 3                      | Wheat middlings .....       | 75.0        | 78.5            | 79.8     | 33.1   | 81.3                       | 86.3 |
| 6                      | Cottonseed meal .....       | 73.7        | 76.1            | 88.4     | 55.5   | 60.6                       | 93.3 |



TABLE I—DIGESTION COEFFICIENTS.—Continued.

| Number of<br>Experiments | KIND AND CONDITION<br>OF FOOD.                          | Dry<br>Matter. | Organic<br>Matter. | Protein. | Fiber. | N-free<br>Ext.<br>Carbohy-<br>drates. | Fat. |
|--------------------------|---------------------------------------------------------|----------------|--------------------|----------|--------|---------------------------------------|------|
| BY-PRODUCTS.             |                                                         |                |                    |          |        |                                       |      |
| 6                        | Cottonseed hulls when fed<br>with cottonseed meal ..... | 45.0           |                    |          | 46.0   | 51.0                                  | 76.0 |
| 13                       | Cottonseed hulls .....                                  | 41.0           |                    | 6.0      | 47.0   | 34.0                                  | 79.0 |
| 1                        | Brewers' dried grains .....                             | 61.6           | 65.4               | 79.3     | 52.6   | 57.8                                  | 91.1 |
| 5                        | Gluten feed .....                                       | 86.3           | 87.3               | 85.6     | 78.0   | 89.2                                  | 84.4 |
| 4                        | Gluten meal .....                                       | 89.7           | 90.4               | 88.2     |        | 89.8                                  | 94.4 |
| 12                       | Rice meal .....                                         | 75.0           |                    | 63.0     | 26.0   | 86.0                                  | 85.0 |
| 1                        | Linseed meal, O. P. ....                                | 78.7           | 81.2               | 88.8     | 57.0   | 77.6                                  | 88.6 |
| 2                        | Linseed meal, N. P. ....                                | 79.2           | 81.8               | 85.2     | 80.4   | 86.1                                  | 96.6 |
| 7                        | Beet pulp .....                                         | 82.0           |                    | 63.0     | 83.0   | 84.0                                  |      |
| 5                        | Meat scraps .....                                       | 93.0           |                    | 93.0     |        |                                       | 98.0 |
| 2                        | Dried blood .....                                       | 63.0           |                    | 62.0     |        | 100.0                                 | 1.0  |
| NON-LEGUMINOUS HAYS.     |                                                         |                |                    |          |        |                                       |      |
| 17                       | Timothy .....                                           | 56.6           | 57.9               | 46.9     | 52.5   | 62.3                                  | 52.2 |
| 2                        | Crab grass .....                                        | 53.6           | 55.0               |          | 59.1   | 54.5                                  | 46.8 |
| 2                        | Johnson grass .....                                     | 56.5           | 58.3               | 41.4     | 65.7   | 56.9                                  | 38.4 |
| 2                        | Orchard grass .....                                     | 56.6           | 57.8               | 59.5     | 60.4   | 55.4                                  | 53.8 |
| 1                        | Oat hay .....                                           | 49.3           | 50.1               | 54.2     | 43.5   | 52.0                                  | 61.9 |
| 94                       | Meadow hay, med. in protein                             | 61.0           |                    | 57.0     | 60.0   | 64.0                                  | 53.0 |
| 2                        | Corn fodder .....                                       | 56.0           |                    | 56.0     | 61.0   | 59.0                                  | 63.0 |
| 1                        | Sorghum fodder, pulled .....                            | 63.1           | 64.8               | 60.8     | 70.4   | 64.5                                  | 46.7 |
| 2                        | Swamp bay .....                                         | 39.0           |                    | 34.0     | 33.0   | 46.0                                  | 44.0 |
| 2                        | Red top .....                                           | 59.7           | 61.2               | 61.3     | 61.3   | 61.9                                  | 50.5 |
| 1                        | Barnyard millet.....                                    | 57.4           | 56.8               | 63.7     | 61.6   | 51.6                                  | 46.3 |
| LEGUMINOUS HAYS.         |                                                         |                |                    |          |        |                                       |      |
| 1                        | Cowpea vine.....                                        | 59.2           | 60.0               | 64.8     | 42.0   | 70.6                                  | 51.8 |
| 2                        | Peanut .....                                            | 60.0           |                    | 63.0     | 52.0   | 70.0                                  | 66.0 |
| 1                        | Hairy vetch .....                                       | 69.4           | 71.80              | 82.3     | 61.0   | 72.9                                  | 70.3 |
| 3                        | Alfalfa .....                                           | 58.9           | 60.7               | 72.0     | 46.0   | 69.2                                  | 51.0 |
| 1                        | Soy bean.....                                           | 62.4           | 63.9               | 71.1     | 60.8   | 68.8                                  | 29.2 |
| 46                       | Red clover in bloom .....                               | 61.0           |                    | 62.0     | 49.0   | 69.0                                  | 62.0 |
| 1                        | White clover .....                                      | 66.            | 66.6               | 73.2     | 60.6   | 69.5                                  | 50.6 |
| 4                        | Crimson clover .....                                    | 58.1           | 59.1               | 68.7     | 46.7   | 64.6                                  | 43.4 |
| 2                        | Alsike clover .....                                     | 62.3           | 63.2               | 66.1     | 53.5   | 70.7                                  | 50.2 |
| 1                        | Vetch and oats .....                                    | 58.1           | 58.7               | 59.7     | 66.0   | 54.2                                  | 18.6 |
| 2                        | Clover and timothy .....                                | 54.6           | 53.2               | 42.3     | 49.6   | 57.5                                  | 54.0 |

**Average Composition of feeding stuffs.**—Average amounts of the total and digestible nutrients in the more common feeding stuffs will be found in Table II. It is essential, of course, to know the digestible nutrients in the various materials available at advantageous prices in deciding upon a ration which will supply them in proper amounts.

Feeds are not constant in composition and the figures given represent averages computed usually from a number of analyses. They are taken principally from Henry's Feeds and Feeding. For additional data reference is made to the following compilations:

Bul. No. 11, office of Experiment Stations, U. S. Dept. Agriculture, by Jenkins and Winton.

Farmers' Bul., No. 22, U. S. Dept. Agriculture, by E. W. Allen.

The Feeding of Animals, by W. H. Jordan, published by the MacMillan Co.

**TABLE II.—Composition and Digestible Nutrients in Common Feeding Stuffs.**

| FEEDING STUFF.                                    | Total Nutrients in 100 lbs. |                |                        |              | in<br>Dry matter<br>100 lbs. | Digestible Nutrients<br>in 100 lbs. |                |                 |
|---------------------------------------------------|-----------------------------|----------------|------------------------|--------------|------------------------------|-------------------------------------|----------------|-----------------|
|                                                   | Crude fat.                  | Crude Protein. | Nitrogen Free Extract. | Crude Fiber. |                              | Crude Fat.                          | Crude Protein. | Carbo-hydrates. |
| Corn.....                                         | 5.00                        | 10.30          | 70.40                  | 2.20         | 89.1                         | 4.30                                | 7.90           | 66.70           |
| Corn and cob meal ....                            | 3.50                        | 8.50           | 64.80                  | 6.60         | 84.9                         | 2.90                                | 4.40           | 60.0            |
| Corn bran .....                                   | 5.80                        | 9.00           | 62.20                  | 12.70        | 90.9                         | 4.60                                | 7.40           | 59.8            |
| Corn cob .....                                    | 0.50                        | 2.40           | 54.90                  | 30.10        | 89.3                         | 0.3                                 | 0.40           | 52.5            |
| Gluten meal .....                                 | 11.80                       | 29.30          | 46.50                  | 3.30         | 91.80                        | 11.00                               | 25.8           | 43.3            |
| Hominy chop .....                                 | 8.30                        | 9.80           | 64.50                  | 3.80         | 88.9                         | 6.80                                | 7.50           | 55.2            |
| Germ meal .....                                   | 7.10                        | 11.80          | 62.50                  | 9.90         | 89.6                         | 6.20                                | 9.00           | 61.20           |
| <sup>1</sup> Ground ear corn<br>with Shucks ..... | 3.66                        | 7.31           | 67.34                  | 8.67         |                              |                                     |                |                 |
| Kaffir corn seed .....                            | 3.00                        | 9.90           | 74.90                  | 1.40         | 84.80                        | 2.70                                | 7.80           | 57.10           |
| Wheat .....                                       | 2.10                        | 11.90          | 71.90                  | 1.80         | 89.50                        | 1.70                                | 10.20          | 69.2            |
| Wheat bran .....                                  | 4.00                        | 15.40          | 53.90                  | 9.00         | 88.10                        | 2.70                                | 12.20          | 39.20           |
| Wheat shorts .....                                | 4.50                        | 14.90          | 56.80                  | 7.40         | 88.20                        | 3.80                                | 12.20          | 50.0            |
| Wheat middlings .....                             | 4.00                        | 15.60          | 60.40                  | 4.60         | 87.9                         | 3.40                                | 12.80          | 53.0            |
| Wheat flour, low grade                            | 3.90                        | 18.00          | 63.30                  | 0.90         | 87.6                         | 0.90                                | 8.20           | 62.7            |
| Wheat screenings.....                             | 3.00                        | 12.50          | 65.10                  | 4.90         | 88.4                         | 2.20                                | 9.80           | 51.00           |
| Barley .....                                      | 1.80                        | 12.40          | 69.80                  | 2.70         | 89.1                         | 1.60                                | 8.70           | 65.6            |

**TABLE II.**—COMPOSITION AND DIGESTIBLE NUTRIENTS IN COMMON FEEDING STUFFS—Continued.

| FEEDING STUFFS.                                        | Total nutriment in 100 lbs. |                |                        |              | Dry matter<br>in 100<br>lbs. | Digestible Nutrients<br>in 100 lbs. |                |                     |
|--------------------------------------------------------|-----------------------------|----------------|------------------------|--------------|------------------------------|-------------------------------------|----------------|---------------------|
|                                                        | Crude Fat.                  | Crude Protein. | Nitrogen-free Extract. | Crude Fiber. |                              | Crude Fat.                          | Crude Protein. | Carbo-<br>hydrates. |
| Malt sprouts.....                                      | 1.70                        | 23.20          | 48.50                  | 10.17        | 89.8                         | 1.70                                | 18.6           | 37.1                |
| Brewers' dried grains..                                | 5.60                        | 19.90          | 51.70                  | 11.00        | 91.8                         | 5.1                                 | 15.7           | 36.3                |
| Oats .....                                             | 5.00                        | 11.80          | 59.70                  | 9.50         | 89.0                         | 4.2                                 | 9.20           | 47.3                |
| Oat dust .....                                         | 4.80                        | 13.50          | 50.20                  | 18.20        | 93.5                         | 5.1                                 | 8.90           | 38.40               |
| Oat shorts .....                                       | 7.10                        | 16.00          | 59.40                  | 6.10         | 92.30                        | 2.80                                | 12.50          | 46.90               |
| Oat hulls .....                                        | 1.00                        | 3.30           | 52.10                  | 29.70        | 90.6                         | 0.6                                 | 1.3            | 40.1                |
| Rice meal .....                                        | 13.10                       | 12.00          | 51.20                  | 5.40         |                              |                                     |                |                     |
| Rice polish .....                                      | 7.30                        | 11.70          | 58.00                  | 6.30         | 90.0                         | 6.5                                 | 9.00           | 56.4                |
| <sup>2</sup> Rice bran.....                            | 8.80                        | 12.10          | 49.90                  | 9.50         | 90.3                         | 7.30                                | 5.30           | 45.10               |
| Rice hulls .....                                       | 0.70                        | 3.60           | 38.60                  | 35.70        | 91.8                         | 0.6                                 | 1.6            | 44.5                |
| Buckwheat .....                                        | 2.20                        | 10.00          | 64.50                  | 8.70         | 87.4                         | 1.8                                 | 7.70           | 49.2                |
| Buckwheat bran.....                                    | 3.30                        | 12.40          | 38.80                  | 31.90        | 89.5                         | 1.9                                 | 7.4            | 30.4                |
| Buckwheat shorts .....                                 | 7.60                        | 27.00          | 40.80                  | 8.30         | 88.9                         | 5.50                                | 21.10          | 33.50               |
| Buckwheat middlings                                    | 7.10                        | 28.90          | 41.90                  | 4.10         | 87.3                         | 3.4                                 | 22.0           | 33.4                |
| Buckwheat hulls.....                                   | 1.10                        | 4.60           | 35.30                  | 43.50        | 86.8                         | 0.6                                 | 2.1            | 27.9                |
| Cottonseed .....                                       | 19.90                       | 18.40          | 24.70                  | 23.20        | 89.7                         | 17.3                                | 12.5           | 30.0                |
| Cottonseed meal .....                                  | 7.50                        | 40.62          | 26.00                  | 6.50         | 91.80                        | 7.00                                | 35.90          | 19.35               |
| Cottonseed hulls .....                                 | 2.20                        | 4.20           | 33.40                  | 46.30        | 88.9                         | 1.70                                | 0.30           | 33.1                |
| <sup>3</sup> Cottonseed hulls,<br>fed with meal 4:1 .. | 2.20                        | 4.2            | 33.4                   | 46.3         | 88.9                         | 1.73                                | 1.50           | 39.9                |
| Peanut kernels .....                                   | 39.60                       | 27.90          | 15.60                  | 7.00         |                              |                                     |                |                     |
| Peanut meal .....                                      | 8.00                        | 47.60          | 23.70                  | 5.10         | 89.3                         | 6.90                                | 42.9           | 22.8                |
| Millet seed .....                                      | 4.00                        | 11.80          | 57.40                  | 9.50         | 86.0                         | 3.20                                | 8.9            | 45.0                |
| Flax seed .....                                        | 33.70                       | 22.60          | 23.20                  | 7.10         | 90.8                         | 29.0                                | 20.6           | 17.1                |
| Milo maize .....                                       |                             |                |                        |              |                              |                                     |                |                     |
| Kaffir corn .....                                      |                             |                |                        |              | 84.8                         | 2.70                                | 7.8            | 57.10               |
| Rye .....                                              | 1.70                        | 10.60          | 72.50                  | 1.70         |                              |                                     |                |                     |
| Sunflower seed .....                                   | 21.20                       | 16.30          | 21.40                  | 29.90        | 92.5                         | 29.0                                | 12.1           | 20.8                |
| Dried blood .....                                      | 2.50                        | 84.40          |                        |              | 91.5                         | 2.50                                | 52.3           | 0.0                 |
| Meat scraps .....                                      | 13.70                       | 71.20          |                        |              | 89.3                         | 13.70                               | 66.2           |                     |
| Beet molasses .....                                    |                             | 9.10           | 59.50                  |              | 79.20                        |                                     |                | 59.5                |
| <sup>2</sup> Blackstrap molasses                       |                             | 2.40           | 65.90                  |              | 77.6                         |                                     |                | 65.9                |

**TABLE II.**—COMPOSITION AND DIGESTIBLE NUTRIENTS IN COMMON FEEDING STUFFS—Continued.

| FEEDING STUFFS.                                     | Total Nutrients in 100 lbs. |                |                        |              | Dry Matter<br>in 100<br>lbs. | Digestible Nutrients<br>in 100 lbs. |                |                |
|-----------------------------------------------------|-----------------------------|----------------|------------------------|--------------|------------------------------|-------------------------------------|----------------|----------------|
|                                                     | Crude Fat.                  | Crude Protein. | Nitrogen-free Extract. | Crude Fiber. |                              | Crude Fat.                          | Crude Protein. | Carbohydrates. |
| Timothy .....                                       | 2.50                        | 5.90           | 45.00                  | 29.00        | 86.80                        | 1.40                                | 2.80           | 43.40          |
| Mixed hay .....                                     | 2.50                        | 7.40           | 42.10                  | 27.20        | 87.10                        | 1.2                                 | 5.90           | 40.9           |
| Johnson grass .....                                 | 2.10                        | 7.20           | 45.90                  | 28.50        | 85.70                        | 1.2                                 | 6.00           | 41.40          |
| Crab grass.....                                     | 1.60                        | 6.90           | 41.00                  | 32.90        |                              | 0.6                                 | 2.20           | 42.80          |
| Oat hay.....                                        | 2.30                        | 9.30           | 39.00                  | 29.20        | 91.1 <sup>2</sup>            | 1.5                                 | 4.30           | 46.4           |
| Kentucky blue grass                                 | 3.90                        | 7.80           | 37.80                  | 23.00        | 78.8                         | 2.0                                 | 4.80           | 37.3           |
| Orchard grass .....                                 | 2.60                        | 8.10           | 41.00                  | 32.40        | 90.1                         | 1.4                                 | 4.9            | 42.3           |
| Cornfodder (leaves)....                             | 3.30                        | 11.00          | 41.50                  | 24.70        |                              |                                     |                |                |
| <sup>4</sup> Entire corn plant,<br>field cured..... | 1.60                        | 4.50           | 34.7                   | 14.3         |                              |                                     |                |                |
| <sup>4</sup> Cornstover, field cur'd                | 1.1                         | 3.80           | 31.5                   | 19.7         | 59.50                        | 0.7                                 | 1.7            | 32.4           |
| Corn silage .....                                   | 0.80                        | 1.70           | 11.00                  | 6.00         | 20.9                         | 0.7                                 | 0.9            | 11.3           |
| Sorghum silage .....                                | 0.30                        | 0.80           | 15.30                  | 6.40         | 23.9                         | 0.2                                 | 0.6            | 14.9           |
| Wheat straw .....                                   | 1.30                        | 3.40           | 43.40                  | 38.10        | 90.4                         | 0.4                                 | 0.4            | 36.3           |
| Oat straw .....                                     | 2.30                        | 4.00           | 42.10                  | 37.00        | 90.8                         | 0.8                                 | 1.2            | 38.6           |
| Rye straw .....                                     | 1.20                        | 3.00           | 46.60                  | 38.90        | 92.9                         | 0.4                                 | 0.6            | 40.6           |
| Corn shucks .....                                   | 0.9                         | 3.30           | 51.6                   | 32.8         | 91.9                         |                                     |                |                |
| Alfalfa .....                                       | 2.20                        | 14.30          | 42.70                  | 25.00        | 91.60                        | 1.20                                | 11.00          | 39.60          |
| Japan clover<br>(lespedeza) .....                   | 3.70                        | 13.80          | 39.00                  | 24.00        | 89.7 <sup>3</sup>            | 1.8                                 | 7.60           | 42.2           |
| Red clover, meadow ..                               | 3.30                        | 12.30          | 38.10                  | 24.80        | 84.7                         | 1.70                                | 6.8            | 35.80          |
| White clover .....                                  | 2.90                        | 15.70          | 39.30                  | 24.10        | 90.3                         | 1.50                                | 11.5           | 42.2           |
| Crimson clover .....                                | 2.80                        | 15.20          | 36.60                  | 27.20        | 90.4                         | 1.20                                | 10.5           | 34.9           |
| Cowpea vine.....                                    | 2.20                        | 16.60          | 42.20                  | 20.10        | 89.3                         | 1.10                                | 10.80          | 38.6           |
| <sup>2</sup> Peanut vine .....                      | 4.60                        | 10.70          | 42.70                  | 23.60        | 92.4                         | 3.0                                 | 6.70           | 42.2           |
| <sup>2</sup> Vetch .....                            | 2.30                        | 17.00          | 36.10                  | 25.40        | 88.7                         | 1.4                                 | 12.9           | 47.5           |
| <sup>5</sup> Rutabaga .....                         | 0.20                        | 1.20           | 7.50                   | 1.30         | 11.4                         | 0.2                                 | 0.9            | 7.1            |
| <sup>5</sup> Mangel-Wurzel .....                    | 0.20                        | 1.40           | 5.50                   | 0.90         | 9.1                          | 0.2                                 | 1.1            | 4.8            |
| <sup>5</sup> Turnips .....                          | 0.20                        | 1.10           | 6.20                   | 1.20         | 9.5                          | 0.2                                 | 0.6            | 5.5            |
| Sweet potatoes.....                                 | 0.40                        | 1.50           | 24.70                  | 1.30         |                              |                                     |                |                |

1. One analysis only.

2. Bul. No. 115. of La. Exp. Sta. Molasses contains practically no true protein.

3. Computed from digestion coefficients in Bul. 33, office Experiment Station, U. S. Dept. Agriculture, p. 387.

4. Jordan, Feeding of Farm Animals.

5. Woll, Handbook for Farmers and Dairyemen.



**ADULTERATION.**

Before the existence of the system of inspection in the various states, it cannot be denied that some manufacturers yielded to the temptation to increase their profits by the unscrupulous adulteration of pure by-products or of a feed mixture with cheap materials of little value to the purchaser. Corn chops and wheat bran were oftentimes adulterated with cob meal or corn bran. Rice hulls, weed seed, screenings of various kinds, elevator sweepings, peanut hulls, etc., are among the more common adulterants.

Some of these possess a distinct value as a source of nutrients, but the presence of any adulterant ought to be declared, when their use at all is permissible under the law.

**TABLE III.—Composition of some materials used to adulterate Feeding stuffs.\***

| MATERIAL.              | Crude Fat<br>Per Cent. | Crude Protein<br>Per Cent. | Carbo-<br>hydrates<br>Per Cent. | Crude Fiber<br>Per Cent. |
|------------------------|------------------------|----------------------------|---------------------------------|--------------------------|
| Ground corn cobs.....  | 0.40                   | 2.20                       | 57.70                           | 31.20                    |
| Peanut hulls .....     | 1.20                   | 5.50                       | 13.70                           | 70.90                    |
| Rice hulls .....       | 0.70                   | 2.10                       | 36.10                           | 37.40                    |
| Weed seeds .....       | 7.00                   | 13.30                      | 53.90                           | 11.60                    |
| Buckwheat hulls .....  | 1.00                   | 4.90                       | 38.50                           | 43.10                    |
| Oat hulls .....        | 0.60                   | 2.30                       | 52.00                           | 33.30                    |
| Wheat screenings ..... | 2.30                   | 11.90                      | 64.20                           | 8.40                     |
| Flax screenings.....   | 12.30                  | 15.30                      | 39.40                           | 15.50                    |
| Corn screenings .....  | 2.70                   | 8.60                       | 64.40                           | 8.60                     |
| Corn bran .....        | 5.80                   | 9.00                       | 62.20                           | 12.70                    |

**Nutritive ratio.**—In view of the fact that the proteins in feeds perform functions widely differing in the main from the remaining portion, fats and carbohydrates, the ratio of the amount of digestible protein to that of the digestible carbohydrates plus the carbohydrate equivalent of the digestible fat presents in a condensed way an idea of the general character of a ration or a feeding stuff. The fat is reduced to the carbohydrate equivalent by multiplying the amount in a digestible form by 2.40, since one pound of fat produces approximately as much energy as 2.4 pounds of carbohydrates.

\* Kentucky Bul. No. 131, p. 61, and partly also from Indiana Bul. No 131, p. 324.

An example will illustrate this clearly. If a horse or mule is fed daily a ration consisting of 2 pounds of cottonseed meal, 12 pounds of corn, and 12 pounds of corn fodder, we may ascertain from the table of average digestible nutrients on page 17 that:

|                                   | Digestible<br>Protein<br>lbs. | Digestible<br>Fat<br>lbs. | Digestible<br>Carbohy-<br>drates—lbs. |
|-----------------------------------|-------------------------------|---------------------------|---------------------------------------|
| 2 lbs. cottonseed meal contain    | 0.71                          | 0.14                      | 0.38                                  |
| 12 lbs. cracked corn contain .... | 0.95                          | 0.51                      | 8.00                                  |
| 5 lbs. Alfalfa hay contain .....  | 0.55                          | 0.06                      | 1.98                                  |
| 5 lbs. Timothy hay contain .....  | 0.14                          | 0.07                      | 2.17                                  |
| 24 lbs. of ration contain .....   | 2.35                          | 0.78                      | 12.53                                 |

Reducing the fat to the carbohydrate equivalent by multiplying the amount by 2.4, as already explained, we have  $0.78 \times 2.4 = 1.87$ , which added to the amount of carbohydrates, 12.53, gives 14.40, and the nutritive ratio is, therefore

2.35 (Protein): 14.40 (carbohydrates + fat equivalent).

Dividing both terms of above ratio by the first, 2.35, for convenience of expression, we have,

1 : 6.1.

The nutritive ratio of any ration may be computed in a similar way. A *wide ratio* indicates, of course, a preponderance of carbohydrates in the feed or ration, e. g., the nutritive ratio of corn is rather wide, being approximately 1 : 9.7. A *narrow ratio*, on the other hand, shows at once a large proportion of protein as compared with carbohydrates, e. g., that of cottonseed meal is approximately 1 : 1.1.

The difficulties which surround the accurate determination of the digestibility of the several nutrients and the variations which may exist in the **actual value** of these in various feeds should not be overlooked in the use of nutritive ratios, which, in the present state of our knowledge, are not intended to convey information of an exact character. This is not to say, however, that the use of these ratios is not helpful and useful.

**VALUE OF MANURE FROM CONCENTRATED FEEDS.**

Methodical experiments have shown repeatedly that we are safe in assuming that about 80 per cent of the fertilizer constituents of feeds may be recovered in the manure of the animals fed. This refers, of course, to the urine as well as the solid excrement. Farmers who are accustomed to the purchase of commercial fertilizers may be somewhat surprised to note the high value of the manure from the more concentrated feeds. That a wise economy demands the careful preservation of this manure will be generally admitted, and the figures in the short tabular statement following may serve a useful purpose in directing more careful attention to the value of manures from these feeds.

Every concentrated feed stuff possesses, therefore, two distinct values, a feeding value and a manurial value, and, so far as possible, the farmer and the feeder should certainly arrange to make the fullest possible use of them, and, consequently, this is a matter which should not be overlooked in the purchase of feed supplies.

Assuming that 80 per cent of the manurial value of feeds is recoverable in the manure, and assigning a value of 5c a pound for phosphoric acid, 5c a pound for potash, and 20c a pound for nitrogen, the value of a ton of manure from several common feeds is computed in the table which follows.

This table is inserted to direct especial attention to the importance of conserving manure from concentrated feeds. The actual comparative value of manure depends largely upon the effectiveness of method of preservation and cost of application, etc.

TABLE IV.—Manurial value of feeding stuffs.\*

(Values Computed on Basis of 80% Recovery.)

| MATERIAL.                | Nitrogen<br>Per Cent. | Phosphoric<br>Acid<br>Per Cent. | Potash<br>Per Cent. | Approximate<br>Manurial Value<br>Per Ton. |
|--------------------------|-----------------------|---------------------------------|---------------------|-------------------------------------------|
| Cottonseed .....         | 3.13                  | 1.27                            | 1.17                | \$ 11.97                                  |
| Cottonseed meal .....    | 6.79                  | 2.88                            | 1.50                | 25.23                                     |
| Cottonseed hulls .....   | 0.69                  | 0.25                            | 1.02                | 3.22                                      |
| Corn .....               | 1.82                  | 0.70                            | 0.40                | 6.70                                      |
| Corn and Cob meal ...    | 1.41                  | 0.57                            | 0.47                | 5.34                                      |
| Corn bran .....          | 1.63                  | 1.21                            | 0.68                | 6.73                                      |
| Gluten meal .....        | 5.03                  | 3.30                            | 0.50                | 19.14                                     |
| Gluten feed .....        | 3.84                  |                                 | 0.41                | 12.62                                     |
| Wheat bran .....         | 2.67                  | 2.89                            | 1.61                | 12.14                                     |
| Wheat middlings .....    | 2.63                  | 0.95                            | 0.63                | 9.68                                      |
| Oats .....               | 2.06                  | 0.82                            | 0.62                | 7.74                                      |
| Oat shorts .....         | 1.72                  | 0.91                            | 0.53                | 6.66                                      |
| Oat hulls .....          | 0.52                  | 0.24                            | 0.52                | 2.27                                      |
| Rice polish .....        | 1.97                  | 2.67                            | 0.71                | 9.01                                      |
| Rice bran .....          | 0.71                  | 0.29                            | 0.24                | 2.70                                      |
| Dried Brewers' grains .. | 3.62                  | 1.03                            |                     | 12.41                                     |
| Malt sprouts .....       | 3.55                  | 1.43                            | 1.63                | 13.81                                     |
| Peas .....               | 3.08                  | 8.20                            | 0.99                | 17.21                                     |
| Soja beans .....         | 5.30                  | 1.87                            | 1.99                | 20.05                                     |
| Mixed hay .....          | 1.41                  | 0.27                            | 1.55                | 5.97                                      |
| Timothy hay.....         | 1.26                  | 0.53                            | 0.90                | 5.18                                      |
| Soja bean hay.....       | 2.32                  | 0.67                            | 1.08                | 8.82                                      |
| Red clover.....          | 2.07                  | 0.38                            | 2.20                | 8.69                                      |
| Crimson clover .....     | 2.05                  | 0.40                            | 1.31                | 7.93                                      |
| Peavine hay .....        | 1.95                  | 0.52                            | 1.47                | 7.83                                      |
| Alfalfa hay .....        | 2.19                  | 0.51                            | 1.68                | 8.76                                      |

\* Analyses from Henry's Feeds and Feeding, pp. 631-634.

**FEEDING STANDARDS.**

**Concerning standards in general.**—It is almost needless to state that we are not in the possession of information which will enable us to compute without error the amounts of feeding stuff nutrients which animals kept for various purposes should receive daily. Certainly there are no formulas which are to replace good judgment and common sense. It has been pointed out that feeds vary somewhat in



composition, and that rations containing the same proportion of nutrients may differ somewhat also in their actual value to the animal on account of differences in ease of digestion and assimilation. Therefore feeding standards are not absolute, but they are intended as guides to the practical feeder.

In reference to these standards, Dr. Jordan has said in part: "While these formulas are certainly an aid in selecting adequate and uniform rations, they are nevertheless merely an imperfect expression of relations not fully understood that have a greatly variable application in practice, an application judiciously made only through the exercise of a judgment enlightened by familiarity with fundamental facts and principles. Rational cattle feeding is not to be attained through a blind acceptance of existing standard rations, but by means of a broad understanding of the scientific and practical knowledge in which these standards had their rise."\*

In these standards the teaching of practical experience and the results of scientific inquiry are brought together. Those first proposed by Wolff and modified later by Lehmann and known as the Wolff-Lehmann standards, have been widely used. Some investigators prefer to modify these still further to conform to results of other experimental work.

**Table of feeding standards.**—The standards given in table V are taken from the *Feeding of Animals*, by Jordan. They are general guides not to be regarded as invariable or as "prescriptions."

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\* Jordan's *Feeding of Animals*, preface, p. VI.

TABLE V.—Feeding Standards.

| KIND OF ANIMAL.                 | Dry Matter in Ration—lbs. | Digestible Organic Nutrients for 1000 lbs. live weight of Animal. |                    |          |            | Nutritive Ratio. |
|---------------------------------|---------------------------|-------------------------------------------------------------------|--------------------|----------|------------|------------------|
|                                 |                           | Protein lbs.                                                      | Carbohydrates lbs. | Fat lbs. | Total lbs. |                  |
| 1. Oxen:                        |                           |                                                                   |                    |          |            |                  |
| When at rest .....              | 18                        | 0.70                                                              | 8.00               | 0.10     | 8.80       | 1 : 11-8         |
| When at light work .....        | 22                        | 1.40                                                              | 10.00              | 0.30     | 11.70      | 1 : 7-70         |
| When at moderate w'rk .....     | 25                        | 2.00                                                              | 11.50              | 0.50     | 14.00      | 1 : 6-5          |
| When at hard work .....         | 28                        | 2.80                                                              | 13.00              | 0.80     | 16.60      | 1 : 5-3          |
| 2. Horses:                      |                           |                                                                   |                    |          |            |                  |
| When at light work .....        | 20                        | 1.50                                                              | 9.50               | 0.40     | 11.40      | 1 : 7-           |
| When at moderate w'rk .....     | 24                        | 2.00                                                              | 11.00              | 0.60     | 13.60      | 1 : 6-2          |
| When at heavy work ...          | 26                        | 2.50                                                              | 13.30              | 0.80     | 16.60      | 1 : 6-6          |
| Milk cows, when yielding daily: |                           |                                                                   |                    |          |            |                  |
| 11 lbs. milk .....              | 25                        | 1.60                                                              | 10.00              | 0.30     | 11.90      | 1 : 6.7          |
| 16½ lbs. milk .....             | 27                        | 2.00                                                              | 11.00              | 0.40     | 13.40      | 1 : 6.           |
| 22 lbs. milk .....              | 29                        | 2.50                                                              | 13.00              | 0.50     | 16.00      | 1 : 5.7          |
| 27½ lbs. milk .....             | 32                        | 3.30                                                              | 13.00              | 0.50     | 16.00      | 1 : 5.7          |
| 4. Fattening bovines:           |                           |                                                                   |                    |          |            |                  |
| First period .....              | 30                        | 2.50                                                              | 15.00              | 0.50     | 18.00      | 1 : 6.5          |
| Second period .....             | 30                        | 3.00                                                              | 14.50              | 0.70     | 18.20      | 1 : 5.4          |
| Third period .....              | 26                        | 2.70                                                              | 15.00              | 0.70     | 18.40      | 1 : 6.2          |
| 5. Fattening Swine:             |                           |                                                                   |                    |          |            |                  |
| First period .....              | 36                        | 4.50                                                              | 25.00              | 0.70     | 30.20      | 1 : 5.9          |
| Second period .....             | 32                        | 4.00                                                              | 24.00              | 0.50     | 28.5       | 1 : 6.3          |
| Third period .....              | 25                        | 2.70                                                              | 18.00              | 0.40     | 21.1       | 1 : 7.0          |
| 6. Brood Sows .....             | 22                        | 2.50                                                              | 15.50              | 0.40     | 18.4       | 1 : 6.6          |
| 7. Fattening Sheep:             |                           |                                                                   |                    |          |            |                  |
| First period .....              | 30                        | 3.00                                                              | 15.00              | 0.50     | 18.5       | 1 : 5.4          |
| Second period .....             | 28                        | 3.50                                                              | 14.50              | 0.60     | 18.6       | 1 : 4.5          |
| 8. Ewes, suckling lambs....     | 25                        | 2.90                                                              | 15.00              | 0.50     | 18.4       | 1 : 5.6          |

TABLE V.—FEEDING STANDARDS—Continued.

| KIND OF ANIMAL.                     |                       | Dry Matter in Ration lbs. | Digestible Organic Nutrients for 1000 lbs. live weight of Animal. |                   |          |            | Nutritive Ratio. |
|-------------------------------------|-----------------------|---------------------------|-------------------------------------------------------------------|-------------------|----------|------------|------------------|
|                                     |                       |                           | Protein lbs.                                                      | Carbohydrate lbs. | Fat lbs. | Total lbs. |                  |
| 9. Growing Cattle,<br>Dairy Breeds: |                       |                           |                                                                   |                   |          |            |                  |
| Age in Months.                      | Live Weight Per Head. |                           |                                                                   |                   |          |            |                  |
| 2-3                                 | 150 lbs.              | 23                        | 4.00                                                              | 13.00             | 2.00     | 21.00      | 1 : 4.5          |
| 3-6                                 | 300 lbs.              | 24                        | 3.00                                                              | 12.80             | 1.00     | 16.8       | 1 : 5.1          |
| 6-12                                | 500 lbs.              | 27                        | 2.00                                                              | 12.50             | 0.50     | 15.0       | 1 : 6.8          |
| 12-18                               | 700 lbs.              | 26                        | 1.80                                                              | 12.50             | 0.40     | 14.7       | 1 : 7.5          |
| 18-24                               | 900 lbs.              | 26                        | 1.50                                                              | 12.00             | 0.30     | 13.8       | 1 : 8.5          |
| 10. Growing Cattle,<br>Beef Breeds: |                       |                           |                                                                   |                   |          |            |                  |
| Age in Months.                      | Live Weight Per Head. |                           |                                                                   |                   |          |            |                  |
| 2-3                                 | 165 lbs.              | 23                        | 4.2                                                               | 13.0              | 2.00     | 19.20      | 1 : 4.2          |
| 3-6                                 | 330 lbs.              | 24                        | 3.50                                                              | 12.80             | 1.50     | 17.80      | 1 : 4.7          |
| 6-12                                | 550 lbs.              | 25                        | 2.50                                                              | 12.50             | 0.70     | 16.40      | 1 : 6.0          |
| 12-18                               | 750 lbs.              | 24                        | 2.00                                                              | 12.50             | 0.50     | 15.0       | 1 : 6.8          |
| 18-24                               | 935 lbs.              | 24                        | 1.80                                                              | 12.00             | 0.40     | 14.20      | 1 : 7.2          |

## COMPUTATION OF RATIONS.\*

Farmers and feeders generally cannot be too strongly urged to give the closest attention to the composition of feeds used by them. The general functions of the nutrients and the general requirements of animals have been subjects of many researches. If much remains to be learned, much has been ascertained. Suggestions of great value are to be found in the standards. Future studies may modify them, but in the meantime they may prevent waste and serious errors in feeding. The calculation of rations will foster a very desirable spirit of inquiry concerning the composition and digestibility of feeds and of the broad principles underlying the best practice. The method of using the table of standards may be best explained, perhaps, by an illustration which will be found simple enough but which should be thorough-

\* Bulletin No. 146, U. S. Dept. Agriculture, by Dr. H. P. Armsby, explains the computations of rations by use of energy values of feeds.

ly mastered by those who have devoted little thought to the actual composition of feeding stuffs which are used daily.

### AN ILLUSTRATION.

If it is desired to prepare a ration for a dairy cow, e. g., weighing, say, about 900 pounds, it is first necessary to know the average amount of milk produced, because it is evident that the solid matter in the milk must come from the food and the more milk the more feed required. Of course milk rich in butter fat will require more feed, pound for pound, than milk poor in fat.†

For purpose of illustration it will be assumed that a ration is required for a cow giving 22 pounds of milk daily. Turning to the table on page 17 it will be found that nutrients substantially as follows are required:

|                                            |            |
|--------------------------------------------|------------|
| Dry matter.....                            | 29.00 lbs. |
| Digestible protein.....                    | 2.50 lbs.  |
| Digestible carbohydrates.....              | 13.00 lbs. |
| Digestible fat.....                        | 0.5 lbs.   |
| <hr/>                                      |            |
| Total dry matter and nutrients 29 lbs..... | 16.00 lbs. |
| Nutritive ratio of ration.....             | 1 : 5.7    |

It is necessary to decide first on the approximate amount of roughage that may be profitably used, and it will be assumed for purpose of this illustration that this will be, not more than 15 to 20 lbs. daily. This will leave not less than 9 to 14 lbs. to be supplied by the remaining ingredients.

The choice of feeds will be affected by the prevailing market prices, and in many cases also by the materials which the feeder may have on hand.

Most farmers will have corn and hay from mixed grasses but these contain relatively large amount of carbohydrates in proportion to the protein, i. e., the nutritive ratio of any mixture of them would be rather **wide** necessarily, while the ration required has a comparatively **narrow** nutritive ratio. Using, e. g., even 20 pounds of mixed hay containing, according to the digestible nutrients given in the table 1.18 lbs. of protein, there would remain  $2.50 - 1.18 = 1.32$  lbs.

†The difference between poor and rich milk is greater than some might suspect, e. g., in 22 lbs. of milk containing 3.5% fat there are 0.77 lbs. fat, while the same amount of 6% milk contains 1.32 lbs. of fat,—a difference of 0.55 lbs., which, of course must be supplied by nutrients in the feed. Milk is treated in this connection as a primary product.



protein to come from the corn. If 100 lbs. corn can be said to contain 7.9 lbs. digestible protein it would require 16.6 lbs. corn to furnish 1.32 lbs. protein. The ration would contain now enough digestible protein, viz.: 2.50 lbs. (1.18 lbs. from the 20 lbs. of hay and 1.32 lbs. from the 16.6 lbs. of corn). Such a daily ration is obviously impracticable, but, even if it were, it would contain entirely too much carbohydrates in proportion to protein, and the nutritive ratio would be too wide as a consequence, as the following simple computation will show. We find from the table of digestible nutrients that:

|                                       | Total Dry Matter. | Digestible Protein. | Digestible Carbohydrates. | Digestible Fat. | Total Digestible Nutrients. |
|---------------------------------------|-------------------|---------------------|---------------------------|-----------------|-----------------------------|
| 20 lbs. mixed hay contain .....       | 17.4 lbs.         | 1.18 lbs.           | 8.2 lbs.                  | 0.24 lbs.       | 9.62                        |
| 16.6 lbs. corn contain .....          | 14.8 lbs.         | 1.32 lbs.           | 11.1 lbs.                 | 0.71 lbs.       | 13.13                       |
| Totals.....                           | 32.2 lbs.         | 2.50 lbs.           | 19.3 lbs.                 | 0.95 lbs.       | 22.75                       |
| Ration desired should contain.....    | 29.0 lbs.         | 2.50 lbs.           | 13.0 lbs.                 | 0.50 lbs.       | 16.00 lbs.                  |
| Showing, therefore, an excess of..... | 3.2 lbs.          | 0.00 lbs.           | 6.3 lbs.                  | 0.40 lbs.       | 6.75 lbs.                   |

The use of the large amount of corn with the hay was necessary to bring the protein up to the required amount, viz.: 2.5 lbs., but so much corn causes an excess of 6.3 lbs. of carbohydrates, which is about 50 per cent too much. If just enough corn were used to bring the carbohydrates to the proper point, there would not be enough protein in the ration. In other words, corn and hay are too poor in protein in comparison with their carbohydrates.

To make up the standard ration there may be used:

- (1) Some hay (e. g., Alfalfa, clover, or peavine) richer in digestible protein than common non-leguminous hay.
- (2) Some product richer in protein than corn, or,
- (3) Part of the hay and a part of the corn may be replaced by leguminous hay and a by-product feed which are richer in protein than common hay.

An inspection of the table of digestible nutrients is sufficient to emphasize the fact that ordinary farm-grown feeds (with the exception of hay from the clovers and other legumes) contain too little protein in proportion to the carbohydrates to be used in preparing proper rations for hard-worked stock, good dairy cows, etc., and the foregoing example further illustrates this point.

A few patient trials will be rewarded by a familiarity with these calculation and will enable a feeder to select rations in accordance with local conditions and the state of the market. It must not be presumed that the standards may not be modified within reasonable limits, as judgment of the feeder, local and market conditions may warrant or even render necessary. For example, in the South, the price of cottonseed meal may be cheap enough at times to allow the use of more protein than absolutely necessary in a ration, while this may not be found advisable if the protein in the ration were derived from gluten feed, brewers' grains, etc.

Returning now to the standard ration for a dairy cow giving 22 lbs. of milk daily, it will be found that practice in the selection of the different feeds will enable one to make up a ration out of the cheapest materials which are adaptable and available. Every feeder knows that a variety of feeds in a ration is desirable.

Feeders unacquainted with the use of standards and who have given little consideration to the composition of feeding stuffs, will find it interesting and instructive to turn to the table of digestible nutrients on page 17 and compute the composition of the rations which they are using and to compare the result with the feeding standards on page 25.

The rations given below have been selected merely as examples. Those interested in feeding should compute others until the comparatively simple procedure is clear. Market prices will determine what feeds may be used to advantage.

**RATION No. 1.**

(For dairy cow giving about 22 pounds milk daily.)

| KIND OF FEEDING STUFF.    | Cost of One Ton. | Cost of Amount in this Ration. | Total Dry Matter lbs. | Digestible Protein—lbs. | Digestible Carbohydrates—lbs. | Digestible Fat—lbs. | Total Digestible Nutrients lbs. |
|---------------------------|------------------|--------------------------------|-----------------------|-------------------------|-------------------------------|---------------------|---------------------------------|
| 12 lbs. mixed hay .....   | \$ 8.50          | .05c                           | 10.45                 | 0.71                    | 4.90                          | 0.14                | 5.75                            |
| 35 lbs. corn silage ..... | 2.50             | .04c                           | 7.31                  | 0.31                    | 3.95                          | 0.24                | 4.50                            |
| 4 lbs. corn chops .....   | 30.00            | .06c                           | 3.56                  | 0.31                    | 2.66                          | 0.17                | 3.14                            |
| 4 lbs. wheat bran .....   | 27.50            | .06c                           | 3.52                  | 0.49                    | 1.57                          | 0.11                | 2.17                            |
| 2 lbs. cottonseed meal .. | 28.00            | .03c                           | 1.93                  | 0.72                    | .38                           | 0.14                | 1.24                            |
| Totals.....               |                  | .24c                           | 26.77                 | 2.54                    | 13.46                         | 0.80                | 16.80                           |
| The standard ration is .. |                  |                                | 29.00                 | 2.50                    | 13.00                         | 0.50                | 16.00                           |

Nutritive ratio of above ration is .....1 : 6.0

Nutritive ratio of standard ration is .....1 : 5.7

**RATION No. 2.**

| KIND OF FEEDING STUFF.    | Cost of One Ton. | Cost of Amount in this Ration. | Total Dry Matter lbs. | Digestible Protein—lbs. | Digestible Carbohydrates—lbs. | Digestible Fat—lbs. | Total Digestible Nutrients lbs. |
|---------------------------|------------------|--------------------------------|-----------------------|-------------------------|-------------------------------|---------------------|---------------------------------|
| 15 lbs. mixed hay .....   | \$ 8.50          | .06c                           | 13.05                 | 0.88                    | 6.13                          | 0.18                | 7.19                            |
| 5 lbs shorts .....        | 30.00            | .08c                           | 4.41                  | 0.61                    | 2.50                          | 0.19                | 3.30                            |
| 7 lbs. wheat bran .....   | 27.50            | .09c                           | 6.17                  | 0.85                    | 2.74                          | 0.19                | 3.78                            |
| 3 lbs. corn chops .....   | 30.00            | .05c                           | 2.67                  | 0.23                    | 2.00                          | 0.13                | 2.36                            |
| Totals.....               |                  | .28c                           | 26.30                 | 2.57                    | 13.37                         | 0.69                | 16.43                           |
| The standard ration is .. |                  |                                | 29.00                 | 2.50                    | 13.00                         | 0.50                | 16.00                           |

Nutritive ratio of above ration is .....1 : 5.8

Nutritive ratio of standard ration is .....1 : 5.7

**RATION No. 3.**

| KIND OF FEEDING STUFF.        | Cost of One Ton. | Cost of Amount in the Ration. | Total Dry Matter lbs. | Digestible Protein—lbs. | Digestible Carbohydrates—lbs. | Digestible Fat—lbs. | Total Digestible Nutrients lbs. |
|-------------------------------|------------------|-------------------------------|-----------------------|-------------------------|-------------------------------|---------------------|---------------------------------|
| 18 lbs. cowpea hay .....      | \$12.00          | .10c                          | 16.07                 | 1.94                    | 6.86                          | 0.19                | 8.99                            |
| 6 lbs corn and cob meal ..... | 25.00            | .08c                          | 5.10                  | 0.26                    | 3.60                          | 0.17                | 4.03                            |
| 5 lbs. corn chop .....        | 30.00            | .08c                          | 4.46                  | 0.36                    | 3.33                          | 0.21                | 3.90                            |
| Totals.....                   |                  | .26c                          | 25.63                 | 2.56                    | 13.79                         | 0.57                | 16.92                           |
| Standard ration is .....      |                  |                               | 29.00                 | 2.50                    | 13.00                         | 0.57                | 16.00                           |

Nutritive ratio of above ration is.....1 : 5.90

Nutritive ratio of standard ration is.....1 : 5.70

Instead of the cowpea hay, a good quality of lespedeza, clover, or alfalfa hay may be used. The greater portion of the protein in this ration is derived from the leguminous hay used. On this account it might be well to add about 1 lb. of cottonseed meal.

**RATION No. 4.**

| KIND OF FEEDING STUFF.          | Cost of One Ton. | Cost of Amount in this Ration. | Total Dry Matter lbs. | Digestible Protein—lbs. | Digestible Carbohydrates—lbs. | Digestible Fat—lbs. | Total Digestible Nutrients lbs. |
|---------------------------------|------------------|--------------------------------|-----------------------|-------------------------|-------------------------------|---------------------|---------------------------------|
| 15 lbs. Johnson grass hay ..... | \$10.00          | .07c                           | 12.85                 | 0.90                    | 6.21                          | 0.18                | 7.29                            |
| 3 lbs. corn chops .....         | 30.00            | .05c                           | 3.56                  | 0.31                    | 2.67                          | 0.17                | 3.15                            |
| 3 lbs. wheat bran .....         | 27.50            | .04c                           | 2.64                  | 0.37                    | 1.07                          | .08                 | 1.52                            |
| 5 lbs. molasses .....           | 13.50            | .03c                           | 3.88                  |                         | 3.29                          |                     | 3.29                            |
| 2 lbs. cottonseed meal ..       | 28.00            | .03c                           | 1.84                  | 1.07                    | 0.58                          | 0.21                | 1.86                            |
| Totals.....                     |                  | .22c                           | 24.77                 | 2.65                    | 13.82                         | 0.64                | 17.01                           |
| Standard ration is .....        |                  |                                | 29.00                 | 2.50                    | 13.00                         | 0.50                | 16.00                           |

Nutritive ratio of above ration is.....1 : 5.9

Nutritive ratio of standard ration is.....1 : 5.7

It has been stated that feeding stuffs raised on the farm or that be on hand are naturally to be used as far as possible. Market prices



will influence the feeder in buying supplies for completing his rations. It may not infrequently happen that home-grown feeds are such that it may be quite expensive to purchase materials that will bring the mixtures to be used up to the standards. In other cases the standards may be exceeded. It may be repeated that the standards have not been established with such accuracy that reasonable variations from them are not permissible. The use of these standards will prevent grave errors; they are always helpful, but they are not intended to be used as a basis of preparing **absolute recipes** for feeding. The ration that is most profitable for milk or beef may not be the most ideal from the standpoint of the proper nutrition of the animal when considered without regard to cost. The wise feeder will make an effort to harmonize as far as possible these two points of view in every day practice.

**Relative values of feeding stuff nutrients.**—From the standpoint of the practical feeder, the selection of feeds would be greatly simplified if the commercial values of different materials could be composed by assigning certain values per pound for protein, fat, and carbohydrates. For example, if it were ascertained that the digestible protein in all feeds is worth, say,  $2\frac{1}{2}c$  a pound, the fat  $1.5c$  a pound, and the carbohydrates  $1c$  a pound, the comparative value of any feed or ration could be quickly ascertained. Unfortunately relative values cannot be computed in this way, because the relative commercial and physiologic values of the nutrient have not been determined.

Feeds of the same class are best compared on the basis of total digestible matter, e. g., the protein feeds, such as cottonseed meal, linseed meal, on the one hand and gluten feed, bran, distillers' grains, etc., on the other, may be compared on this basis. In a similar way the digestible dry matter in the carbohydrate feeds, such as corn, oats, rice polish, low grade flour, etc., will largely determine their relative values to the feed, but only feeds of the **same general character** may be so compared in determining which is cheapest to buy. The table on page 17 gives the digestible matter in 100 lbs. of all common feeding stuffs, and this should be consulted when feeds are to be purchased.

#### SUGGESTIONS CONCERNING THE PURCHASE OF FEEDS.

All feeding stuffs and mixed feeds should be purchased under a definite guaranty. The minimum amount of each nutrient guaranteed to be present in all kinds of feeds sold in the state will be found on the manufacturer's tag attached to each bag. **A careful inspection of this**

**guaranty should not be omitted.** It is a singular fact that feeders sometimes pay more for a comparatively low grade product than for one containing a large amount of digestible matter.

Feeds are bought for the digestible matter which they contain in palatable form. Guaranties and analyses indicate total nutrients only. If a purchase is made on this basis, the buyer must assure himself that the total amount of nutrients in the feed bears a proper relation to the price asked. To do this analyses and selling prices of various feeds must be considered.

Feeds containing a large percentage of protein are not sold at a low price, because protein is an expensive nutrient. The more concentrated feeds cannot contain a large percentage of fiber. It should be recalled that fiber is the most indigestible portion of the feed, and that the losses in the digestion of it may be great as compared with those of the more easily digested carbohydrates. Such materials as hays, straws, cobs, hulls of seeds, etc., containing large amounts of fiber, are cheap as compared with more concentrated materials, such as cotton-seed meal, corn, oats, shorts, bran, etc.

It is only by careful consideration of chemical composition as shown by guaranties and analyses in these bulletins, of the kind or kinds of material out of which feeds are made, digestibility and selling prices of various products or of feed mixtures that the purchaser may form some good general idea of comparative values of feeds and feeding stuffs. The total digestible dry matter in materials of the same general nature, as pointed out on page 32, is important in consideration of relative values, e. g., in comparing the values of the oil meals; the gluten feed, malt sprouts, brewers' dried grains, etc.; and the carbohydrate feeds, such as corn, oats and cereals generally.

At any rate it should not be said that feeders in this state ever pay as much for a certain feed or product when one of a better quality can be had for less money.

The inspection of feeds in this state is new. In the past, farmers and dealers have given entirely too little consideration to the composition of them. The system of state inspection, publication of analyses and the fair competition of manufacturers will do much, it is hoped, to stimulate a general interest in the elementary principles of feeding, which will result in a more judicious discrimination in the purchase of commercial feeding stuffs.

### SYSTEMATIC FEEDING.

Complaints are sometimes received that certain feeds cause colic, or other derangements of the digestive organs, of horses and mules. While feeds containing rice hulls, damaged grains, etc., are dangerous, the lack of care in feeding is, doubtless, not infrequently responsible for the loss of many animals.

The importance of feeding the hard-worked mules on our plantations three times a day is emphasized by Dr. W. R. Dalrymple in Bul. No. 115 of the Louisiana Experiment Station, and this discussion is inserted here by permission:

"A feeder may have all the information necessary concerning feeding standards, balanced rations, nutritive ratios, etc., and yet he cannot possibly secure the maximum of good results from the possession of such knowledge unless he employs a rational and intelligent system in the feeding of his animals.

"Animals under domestication, such as the live stock of the farm, and more particularly the work horses and mules, are living under artificial conditions in respect to their feeding, and are solely at the mercy of the intelligence, or otherwise, of their owners for the manner, or system, in which their food is supplied to them.

"Under natural conditions, the horse, or mule, owing to the anatomical arrangement of its digestive organs, and its physiological requirements, feeds quite often, but partakes of little at a time. The main reason for this is, the relatively small capacity of its stomach—not more, perhaps, than from 14 to 17 quarts—the short time it takes for the stomach to empty itself, and hence the necessity for frequent replenishment.

"In order to obtain the most satisfactory results, under domestication, or during work, it is reasonable to presume that the animal's natural method of feeding should be approximated as closely as practicable. During the working season on the plantation or farm this would suggest that the day's ration, or the amount of food required by the animal in twenty-four hours, should be divided into at least three feeds. Some animals may, and do, become habituated to a lesser number of feeds per day with, apparently satisfactory results. But it is a risky method, because, instead of getting as close as practicable to the animal's natural way of feeding, it is getting further away from it.

"After an opportunity during the past twenty years, of studying and observing the conditions under which many of our work animals are fed, we have no hesitancy in saying that lack of system in feeding



is responsible for the major portion of the loss of valuable animals from colic, inflammation of the bowels, etc.

"Many who lose valuable mules on the plantations and farms from digestive troubles are wont to place the blame on the kind or class of feed the animals have been given; while, in reality, the blame properly belongs to the unnatural and unintelligent manner in which they receive their feed. A properly-balanced ration of the very best quality of oats, when fed intelligently and systematically, may not induce a case of colic during the natural lifetime of the animal. But if the entire day's ration of oats is fed at one time, instead of its being divided into three parts, it is liable to so derange the digestive apparatus as to set up a fatal case of flatulent colic, because the digestive organs in the horse or mule are not constructed, nor prepared to 'handle' such an excessive quantity of food material all at once. In such a case, are we to blame the oats for the trouble, or the unintelligent manner in which they were fed to the animal? And so it is with other kinds and classes of concentrated feeds; they require system in their administration to prevent indigestion, colic, etc., and to produce the best results in the capacity of the animal for work.

"Some years ago the writer was discussing with an eminent British authority on feeding, the large losses sustained on our plantations as the result of digestive ailments; and, after describing to him the unsystematic method of feeding which at one time prevailed, and, unfortunately, still prevails to too great an extent, his remark was: **'Your main source of trouble** seems to be allowing the animals too much feed at one time, and not feeding them often enough.' And this, apart from the question of inferiority in quality or condition, appears to be the gist of the whole matter with those who suffer loss of work stock as a result of feeding. It is not so much, perhaps, that the animals receive more than is necessary, but that the total amount is not divided into a sufficient number of feeds for the most perfect digestion of the food.

"A point of very great importance for the owner or feeder to bear in mind, therefore, is that an animal's food may be properly balanced as to its digestible nutrients; it may be correct as to quantity and nutritive ration; in fact, be perfect in every particular so far as supplying the needs of the animal is concerned; and, yet, if an intelligent system is not employed in the feeding of it, the otherwise perfect requirements may be altogether vitiated."



## SO-CALLED CONDIMENTAL TONIC AND MEDICINAL STOCK AND POULTRY FEEDS.

Extravagant and absurd claims may be made for feeds of this class which are sold in small packages. As compared with the price asked for them, they possess practically no nutritive value, and their sale is certainly not to be encouraged.

These mixtures may contain almost any common feeding stuff, e. g., wheat by-products, corn products, and also flaxseed meal, cottonseed meal, etc., mixed with certain ingredients added apparently for their "medicinal effect." Such substances as the following have been detected in them: charcoal, ginger, sodium sulphate, common salt, cooking soda, sulphate of iron, sulphur, saltpeter, bone, grit of some kind, gentian, anise seed, fenugreek, etc.

The selling price bears no relation whatever to the actual value of the material. Some sell for more than \$300.00 a ton. With the spread of information concerning the composition and value of feeds, the condimental feeds, powders, medicines, etc., will disappear from the market. Meanwhile intelligent feeders and reliable dealers should actively discourage the waste of money on such comparatively worthless products. Manufacturers of them sometimes seek to avoid having their products inspected by representing them as medicines or tonics.

### THE MISSISSIPPI FEEDING STUFFS LAW.

In practically all of the states in which the sale of feeding stuffs reaches considerable proportions, some system of inspection is provided by law. It will be generally admitted that the careful inspection of feeds is absolutely necessary for the protection of purchasers as well as of sellers and manufacturers who wish to market their products on their merits without fear of unfair competition with inferior fraudulent products.

The law now in force in this state became effective July 1, 1908 (see chap. 107, S. B. No. 367, Laws of 1908). The text of the law was published in full in Bulletin No. 123, issued last June.

### BRIEF SUMMARY OF THE REQUIREMENTS OF THE LAW.

**Feeds to be inspected.**—This law includes all materials and by-products sold or used for feeding except cottonseed meal (inspected under the fertilizer Act) cottonseed hulls, or mixtures of meal and hulls, hays, straws, etc., and **unmixed** feeds consisting of the **entire** grains of the common cereals.

**Requirements concerning composition of feeds.—(1) Minimum amounts of fat and protein allowable—**No feed can be sold that does not contain at least 3.50 per cent of crude **fat**, and the sum of the fat and **protein** in all kinds of feed must be guaranteed to equal 13.50 per cent.

**(2) Maximum amount of fiber.—**No ordinary feed may contain more than 12.00 per cent of **crude fiber**. See discussion of value of fiber in feeding stuffs on page 11. It is provided in section 1, however, that those feeds carrying cottonseed products may contain more than 12.00 per cent of fiber if they are branded "Cow and Ox Feed," but the requirements concerning minimum limits of fat and protein (see Sec. 1) must be complied with by all feeds.

**(3) Tagging bags of feed.—**Each bag of feeding stuff sold in this state must carry **two** tags.

(a) A state inspection tag. These tags are prepared by the state laboratory for sale to manufacturers. They are numbered consecutively and packed in boxes containing 1,000 tags each. It is very inconvenient to supply a smaller number than 500 on any single order.

(b) A manufacturer's or guarantor's tag. This tag is prepared by the manufacturer or original shipper. It must give all of the information outlined in section 5 of the law. It is **important** for manufacturers to see that the guaranteed analysis printed on this tag is **IDENTICAL** with that filed in the office of the State Chemist. Some cases have come to light in which the guaranty on the manufacturer's or seller's tag was found to be higher than the actual or official guaranty. This, of course, is unfair, illegal, and misleading.

**(4) The guaranteed analysis.—**Before any feed or feeding stuff can be offered for sale, the person, firm, or agent responsible for the sale of it must file in the office of the State Chemist (blank forms are provided for this purpose) a guaranteed analysis showing the **MINIMUM** amounts of **FAT**, **PROTEIN**, and **CARBOHYDRATES** and the **MAXIMUM** amount of fiber which the feed will contain, and the product supplied the trade must comply with this guaranty in every respect.

**(5) Samples to be supplied.—**No guaranty can be accepted until a representative sample of the feed has been received by the State Chemist (see section 3). These samples are best forwarded in tin or glass containers and they should not weigh less than one half pound.

**RESPONSIBILITY OF DEALERS.—**The attention of dealers is especially directed to their responsibility in handling feeding stuffs.

This applies particularly to interstate shipments. Dealers will be held directly responsible for the sale of deficient or otherwise illegal feeds or feeding stuffs when these are bought from sellers residing without the state and who cannot be very well reached, therefore, when it becomes necessary to institute proceedings for the recovery of fines and penalties provided for violations of the law.

**SUGGESTIONS TO DEALERS CONCERNING THE PURCHASE OF FEEDS.**—In view of the legal responsibility of dealers, as pointed out in the foregoing paragraph, it becomes important for them to place orders with interstate shippers **ON CONDITION THAT SUCH INTERSTATE SHIPMENTS WILL COMPLY IN EVERY RESPECT WITH THE LAW IN THIS STATE.** In addition to this dealers or their employes should examine all feeds offered for sale to ascertain whether the bags are properly tagged, etc. See the brief summary of the requirements of the law on page 36. The law will be enforced with as little inconvenience as possible to the general trade.

#### **SALE OF RICE HULLS PROHIBITED.**

The sale of rice hulls in this state or the use of these hulls in compounding feeds of any kind is prohibited under authority of section 2. The hulls of rice are so hard and silicious that they are not only indigestible but also irritate the digestive tract of the animal to such an extent that death not infrequently results. Rice hulls are injurious, therefore, within the meaning of section 2 of the law, and this by-product cannot be sold in the state.

#### **ADMINISTRATION OF THE LAW.**

**INSPECTION.**—During the business season inspectors are on the road constantly and samples are drawn from time to time at almost every point in the state where feeds are sold in any considerable quantity. The more important centers of distribution receive especial attention.

Irregularities in the trade are reported without delay to manufacturers or agents and also brought to the attention of dealers, who are held directly responsible for the sale of feed manufactured or shipped from some point without the state.

Samples drawn by inspectors are forwarded to the state chemical laboratory for analysis. Copies of all analyses are sent by mail to dealers owning the original consignments represented by the samples, a duplicate copy going forward at the same time to manufacturer or



jobber. Through this procedure deficiencies brought to light by the analytical work may be corrected without undue delay.

**Drawing samples.**—It is well recognized that the efficiency and fairness of this system of inspection must depend primarily upon the thoroughness of the inspection in the field, upon the representative character of the samples secured, and upon the accuracy of the analytical work. The department employs inspectors trained for the work and great care is exercised by them in taking samples of shipments in the hands of the dealers. In addition to this duplicate samples are frequently drawn, for the purpose of checking the accuracy of the sampling.

All samples are preserved throughout the season, and portions of these are always available should manufacturers desire to have the analytical work checked by their private chemists.

**PUBLICATION OF RESULTS.**—Analyses of samples taken by inspectors and the general results of the inspection are made public through bulletins. Four bulletins are published yearly. Dealers throughout the state are supplied with these publications promptly. Every effort has been made to bring the requirements of the law to the attention of the trade generally, and while petty infractions of it are not as frequent now as formerly, there remains little reason for failure to comply with all of the simple requirements



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                       | Where and from Whom Collected.                          |
|--------------------|-------------------------------------------------------|---------------------------------------------------------|
|                    | <b>AKIN-ERSKINE MILLING CO.,<br/>Evansville, Ind.</b> |                                                         |
| 14496              | Wheat Bran .....                                      | Tupelo Grocery Co., Tupelo.....<br>Guarantee.....       |
|                    | <b>ALFALFA PRODUCTS COMPANY,<br/>Jackson, Miss.</b>   |                                                         |
| 13989              | Uno Horse Feed .....                                  | D. W. Wilkinson & Bro., Jackson.....<br>Guarantee.....  |
|                    | <b>AMERICAN MILLING COMPANY,<br/>Chicago, Ill.</b>    |                                                         |
| 13992              | Sucrene Alfalfa Horse & Mule<br>Feed .....            | D. W. Wilkinson & Bro., Jackson.....                    |
| 13993              | Sucrene Alfalfa Horse & Mule<br>Feed .....            | E. L. Cox, Braxton.....                                 |
| 14498              | Sucrene Alfalfa Horse & Mule<br>Feed .....            | D. W. Wilkinson & Bro., Jackson .....                   |
| 13994              | Sucrene Dairy Feed .....                              | Guarantee.....<br>C. J. Edwards Co., Vicksburg.....     |
| 13997              | Sucrene Horse & Mule Feed .....                       | Guarantee.....<br>P. P. Williams Co., Vicksburg.....    |
| 13998              | Sucrene Horse & Mule Feed .....                       | C. J. Edwards Co., Vicksburg.....                       |
| 13999              | Sucrene Horse & Mule Feed .....                       | Capital Grocery Co., Jackson.....<br>Guarantee.....     |
| 14000              | Sucrene Stock Feed .....                              | Charles Halsmith, Bolton.....                           |
| 14001              | Sucrene Stock Feed .....                              | P. P. Williams Co., Vicksburg.....<br>Guarantee.....    |
|                    | <b>ALABAMA CORN MILLS COMPANY,<br/>Mobile, Ala.</b>   |                                                         |
| 14497              | Wheat Bran .....                                      | Lucedale Commercial Co., Lucedale....<br>Guarantee..... |
|                    | <b>ARKADELPHIA MILLING CO.,<br/>Arkadelphia, Ark.</b> |                                                         |
| 14499              | Wheat Shorts.....                                     | Harris & Co., Meridian.....<br>Guarantee.....           |
|                    | <b>ARLINGTON ROLLER MILLS,<br/>Arlington, Ky.</b>     |                                                         |
| 14500              | Wheat Shorts.....                                     | Farmers Warehouse Co., Houston.....<br>Guarantee.....   |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14496              | 8.41               | 6.46          | 4.34<br>3.50        | 16.56<br>14.00          | 56.17<br>52.00          | 8.06<br>10.00         |
| 13989              | 8.52               | 5.36          | 3.84<br>4.00        | 15.69<br>14.00          | 59.15<br>52.00          | 7.44<br>12.00         |
| 13992              | 9.09               | 5.40          | 3.23                | 12.19                   | 61.52                   | 8.57                  |
| 13993              | 7.69               | 4.22          | 3.11                | 11.00                   | 65.85                   | 8.13                  |
| 14498              | 7.20               | 4.53          | 5.73<br>3.50        | 12.38<br>10.00          | 61.20<br>50.00          | 8.96<br>12.00         |
| 13994              | 8.74               | 7.86          | 5.63<br>3.50        | 17.63<br>16.50          | 50.13<br>46.00          | 10.01<br>12.00        |
| 13997              | 10.44              | 5.82          | 3.95                | 9.38                    | 64.16                   | 6.25                  |
| 13998              | 10.90              | 6.32          | 4.41                | 10.50                   | 61.27                   | 6.60                  |
| 13999              | 8.85               | 6.50          | 3.77<br>3.50        | 9.44<br>10.00           | 62.66<br>50.00          | 8.78<br>12.00         |
| 14000              | 9.56               | 4.26          | 3.09                | 10.75                   | 65.35                   | 6.99                  |
| 14001              | 9.85               | 3.90          | 3.15<br>3.50        | 10.75<br>10.00          | 65.19<br>50.00          | 7.16<br>12.00         |
| 14497              | 6.82               | 7.45          | 5.20<br>4.00        | 16.94<br>14.50          | 55.56<br>50.00          | 8.03<br>9.50          |
| 14499              | 7.68               | 5.45          | 6.75<br>3.50        | 17.06<br>12.00          | 56.99<br>50.00          | 6.07<br>12.00         |
| 14500              | 8.80               | 4.15          | 5.74<br>4.00        | 16.69<br>14.00          | 61.14<br>52.00          | 3.48<br>9.00          |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                             | Where and from Whom Collected.                          |
|--------------------|-----------------------------------------------------------------------------|---------------------------------------------------------|
|                    | <b>BARNET, CRAFT &amp; KAUFFMAN<br/>MILLING COMPANY,<br/>St. Louis, Mo.</b> |                                                         |
| 14503              | Wheat Middlings .....                                                       | Tate Skelton Co., Goodman.....<br>Guarantee.....        |
|                    | <b>MARCUS BERNHEIMER FLOUR<br/>MILLS COMPANY,<br/>St. Louis, Mo.</b>        |                                                         |
| 14504              | Wheat Middlings .....                                                       | J. L. Wells, Meridian .....                             |
|                    | <b>BALLARD &amp; BALLARD COMPANY,<br/>Louisville, Ky.</b>                   |                                                         |
| 14002              | Ballard's Shipstuff .....                                                   | Capital Grocery Co., Jackson.....<br>Guarantee.....     |
| 14501              | Wheat Bran .....                                                            | Ballard & Ballard Co., Jackson.....<br>Guarantee.....   |
|                    | <b>C. BECKER MILLING COMPANY,<br/>Red Bud, Ill.</b>                         |                                                         |
| 14003              | Wheat Shorts.....                                                           | Merchants Grocery Co., Water Valley                     |
| 14502              | Wheat Shorts.....                                                           | Mars Bros., Philadelphia.....<br>Guarantee.....         |
|                    | <b>THE BLAIR MILLING COMPANY,<br/>Atchison, Kansas.</b>                     |                                                         |
| 14004              | Blair's Shorts .....                                                        | Taylor-Wills Grocery Co., Jackson....<br>Guarantee..... |
|                    | <b>BROWDER MILLING COMPANY,<br/>Fulton, Ky.</b>                             |                                                         |
| 14005              | Mixed Feed .....                                                            | Lotterhos & Huber Co., Crystal Sp'gs                    |
| 14505              | Mixed Feed .....                                                            | F. S. Leavell, Oxford.....<br>Guarantee.....            |
|                    | <b>W. P. BROWN &amp; COMPANY,<br/>Memphis, Tenn.</b>                        |                                                         |
| 14006              | Bran .....                                                                  | T. J. Howard, Iuka.....<br>Guarantee.....               |
|                    | <b>CHAPIN &amp; COMPANY,<br/>St. Louis, Mo.</b>                             |                                                         |
| 14007              | Wheat Bran .....                                                            | Queen City Feed Co., Meridian.....                      |
| 14008              | Wheat Bran .....                                                            | Winner-Klein & Co., Meridian.....                       |
| 14009              | Wheat Bran .....                                                            | D. W. Wilkinson & Bro., Jackson.....                    |
| 14010              | Wheat Bran .....                                                            | R. L. Crook & Co., Vicksburg.....<br>Guarantee.....     |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14503              | 7.97               | 5.09          | 5.78<br>4.95        | 18.13<br>17.25          | 54.98<br>55.00          | 8.05<br>6.15          |
| 14504              | 9.70               | 3.11          | 4.24<br>4.00        | 17.25<br>15.00          | 62.98<br>55.00          | 2.72<br>5.00          |
| 14002              | 9.22               | 3.48          | 4.08<br>3.75        | 15.00<br>15.69          | 64.38<br>55.00          | 3.84<br>6.87          |
| 14501              | 8.36               | 6.66          | 4.62<br>4.10        | 14.63<br>14.44          | 57.23<br>50.00          | 8.50<br>9.00          |
| 14003              | 7.43               | 6.28          | 4.94                | 15.63                   | 57.68                   | 8.04                  |
| 14502              | 8.30               | 4.40          | 5.35<br>4.20        | 17.38<br>15.50          | 60.57<br>60.30          | 4.00<br>3.70          |
| 14004              | 9.66               | 4.24          | 4.83<br>3.50        | 17.63<br>14.50          | 59.72<br>56.00          | 3.92<br>9.00          |
| 14005              | 6.56               | 5.90          | 6.72                | 16.00                   | 59.76                   | 5.06                  |
| 14505              | 9.01               | 5.97          | 6.37<br>4.25        | 16.56<br>15.00          | 55.30<br>54.00          | 6.79<br>9.00          |
| 14006              | 6.36               | 6.43          | 5.08<br>3.50        | 18.19<br>12.50          | 56.72<br>54.10          | 7.22<br>10.00         |
| 14007              | 4.51               | 6.72          | 5.58                | 16.44                   | 58.63                   | 8.12                  |
| 14008              | 5.48               | 7.28          | 5.31                | 16.44                   | 56.76                   | 8.73                  |
| 14009              | 8.53               | 6.74          | 4.83                | 16.19                   | 55.79                   | 7.92                  |
| 14010              | 7.88               | 6.88          | 4.90<br>3.50        | 16.38<br>14.00          | 56.79<br>40.00          | 7.17<br>10.00         |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.                          |
|--------------------|----------------------------------------------------------|---------------------------------------------------------|
|                    | <b>CHARLESTON MILLING CO.,</b><br>Charleston, Mo.        |                                                         |
| 14011              | Bran .....                                               | E. Bonelli & Co., .....<br>Guarantee.....               |
|                    | <b>H. C. COLE MILLING COMPANY,</b><br>Chester, Ill.      |                                                         |
| 14012              | Middlings .....                                          | Rumble & Wensel Co., Natchez.....<br>Guarantee.....     |
|                    | <b>COLUMBIA STAR MILLING CO.,</b><br>Columbia, Ill.      |                                                         |
| 14013              | Wheat Bran .....                                         | Hattiesburg Grocery Co., Hattiesburg<br>Guarantee.....  |
|                    | <b>CORNO MILLS COMPANY,</b><br>St. Louis, Mo.            |                                                         |
| 14015              | Corno Hen Feed .....                                     | Crawford Grocery Co., Greenville.....                   |
| 14016              | Corno Hen Feed .....                                     | The Goyer Co., Greenville.....<br>Guarantee.....        |
| 14014              | Corno Horse & Mule Feed.....                             | Hannah Distributing Co., Jackson.....                   |
| 14017              | Corno Horse & Mule Feed.....                             | Crawford Grocery Co., Greenville.....                   |
| 14018              | Corno Horse & Mule Feed.....                             | Greenwood Grocery Co., Greenwood.....                   |
| 14019              | Corno Horse & Mule Feed.....                             | Greenwood Grocery Co., Greenwood.....                   |
| 14020              | Corno Horse & Mule Feed.....                             | T. B. Cockrell, Itta Bena.....                          |
| 14021              | Corno Horse & Mule Feed.....                             | A. J. Lewis, Edwards.....                               |
| 14022              | Corno Horse & Mule Feed.....                             | A. J. Lewis, Edwards.....                               |
| 14023              | Corno Horse & Mule Feed.....                             | P. P. Williams Co., Vicksburg.....                      |
| 14024              | Corno Horse & Mule Feed.....                             | P. P. Williams Co., Vicksburg.....                      |
| 14025              | Corno Horse & Mule Feed.....                             | The Goyer Co., Greenville.....                          |
| 14026              | Corno Horse & Mule Feed .....                            | Greenwood Grocery Co., Greenwood.....                   |
| 14027              | Corno Horse & Mule Feed.....                             | T. B. Cockrell, Itta Bena.....                          |
| 14028              | Corno Horse & Mule Feed.....                             | W. F. Funches & Co., Osyka.....                         |
| 14029              | Corno Horse & Mule Feed.....                             | J. S. Eaton & Bro., Taylorsville.....                   |
| 14030              | Corno Horse & Mule Feed.....                             | Hollaway & McRaney, Collins.....                        |
| 14031              | Corno Horse & Mule Feed.....                             | D. C. Griffith & Co., Silver Creek.....                 |
| 14032              | Corno Horse & Mule Feed.....                             | L. D. Spell & Bro., Georgetown.....                     |
| 14033              | Corno Horse & Mule Feed.....                             | Postlethwaite & Stewart Co., Natchez<br>Guarantee.....  |
|                    | <b>THE DUNLAP MILLING COMPANY,</b><br>Clarksville, Tenn. |                                                         |
| 14508              | Wheat Bran .....                                         | Farmers Warehouse Co., Charleston....<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14011              | 7.76               | 5.02          | 4.75<br>4.75        | 14.88<br>13.10          | 61.23<br>54.50          | 6.36<br>9.20          |
| 14012              | 10.79              | 2.97          | 3.84<br>4.50        | 16.13<br>16.00          | 64.07<br>57.00          | 2.20<br>5.50          |
| 14013              | 7.91               | 6.28          | 5.24<br>3.74        | 17.06<br>15.26          | 57.53<br>53.38          | 5.98<br>9.21          |
| 14015              | 9.39               | 2.20          | 3.77                | 11.25                   | 72.02                   | 1.37                  |
| 14016              | 6.02               | 2.35          | 3.11<br>3.70        | 12.25<br>10.00          | 74.72<br>70.00          | 1.55<br>2.30          |
| 14014              | 6.80               | 4.58          | 4.19                | 12.31                   | 63.85                   | 8.27                  |
| 14017              | 7.24               | 4.20          | 3.69                | 11.56                   | 65.01                   | 8.30                  |
| 14018              | 7.22               | 4.73          | 3.51                | 11.44                   | 64.37                   | 8.73                  |
| 14019              | 6.28               | 3.92          | 3.81                | 11.25                   | 66.76                   | 7.98                  |
| 14020              | 7.69               | 3.66          | 3.54                | 11.44                   | 67.95                   | 5.72                  |
| 14021              | 6.77               | 4.02          | 4.36                | 11.06                   | 66.89                   | 6.90                  |
| 14022              | 7.18               | 3.90          | 4.20                | 11.56                   | 65.90                   | 7.26                  |
| 14023              | 7.05               | 4.06          | 3.65                | 11.44                   | 67.58                   | 6.22                  |
| 14024              | 7.67               | 4.97          | 4.08                | 12.31                   | 63.05                   | 7.92                  |
| 14025              | 6.30               | 4.01          | 3.68                | 11.06                   | 66.73                   | 8.22                  |
| 14026              | 9.58               | 4.92          | 4.18                | 11.69                   | 62.03                   | 7.60                  |
| 14027              | 8.67               | 5.04          | 3.93                | 11.75                   | 61.54                   | 9.07                  |
| 14028              | 11.76              | 3.67          | 3.17                | 11.44                   | 64.67                   | 5.29                  |
| 14029              | 7.66               | 4.09          | 3.61                | 11.00                   | 65.37                   | 8.27                  |
| 14030              | 9.72               | 4.14          | 4.47                | 11.81                   | 64.67                   | 5.19                  |
| 14031              | 8.74               | 4.72          | 4.50                | 11.50                   | 63.79                   | 6.75                  |
| 14032              | 10.75              | 3.95          | 4.33                | 11.38                   | 63.69                   | 5.90                  |
| 14033              | 9.69               | 4.32          | 4.08<br>3.50        | 11.88<br>10.00          | 62.93<br>58.50          | 7.10<br>12.00         |
| 14508              | 8.02               | 6.49          | 4.39<br>4.00        | 15.56<br>14.00          | 57.84<br>55.00          | 7.70<br>10.00         |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                        |
|--------------------|---------------------------------------------------------|-------------------------------------------------------|
|                    | <b>DAHNKE-WALKER MILLING CO.,</b><br>Union City, Tenn.  |                                                       |
| 14034              | Wheat Bran .....                                        | F. Giardina, Greenville.....                          |
| 14506              | Wheat Bran .....                                        | Merchants Grocery Co., Brookhaven..<br>Guarantee..... |
|                    | <b>DAVIS &amp; ANDREWS COMPANY,</b><br>Memphis, Tenn.   |                                                       |
| 14035              | Wheat Shorts.....                                       | J. Niles Boyd, Kosciusko.....<br>Guarantee.....       |
| 14507              | Wheat Bran .....                                        | W. T. Ware, Aberdeen.....<br>Guarantee.....           |
|                    | <b>J. B. EDGAR GRAIN COMPANY,</b><br>Memphis, Tenn.     |                                                       |
| 14038              | Ceralfa Stock Feed .....                                | Planters Supply Co., Greenwood.....                   |
| 14039              | Ceralfa Stock Feed .....                                | Krecker & Moore, Winona.....                          |
| 14040              | Ceralfa Stock Feed .....                                | W. H. Pritchard & Co., Natchez.....                   |
| 14041              | Ceralfa Stock Feed .....                                | R. L. Crook & Co., Vicksburg.....                     |
| 14042              | Ceralfa Stock Feed .....                                | J. C. McClinton, Newton.....                          |
| 14509              | Ceralfa Stock Feed .....                                | R. L. Crook & Co., Vicksburg.....                     |
| 14510              | Ceralfa Stock Feed .....                                | W. H. Pritchard & Co., Natchez.....<br>Guarantee..... |
|                    | <b>EMPIRE RICE MILLING COMPANY,</b><br>New Orleans, La. |                                                       |
| 14043              | Rice Bran .....                                         | C. Atkinson's Sons Co., Summit.....<br>Guarantee..... |
|                    | <b>EDWARDSVILLE MILLING CO.,</b><br>Edwardsville, Ill.  |                                                       |
| 14511              | Wheat Bran .....                                        | A. D. Smith & Co., Indianola.....<br>Guarantee.....   |
|                    | <b>M. FORCHHEIMER &amp; COMPANY,</b><br>Mobile, Ala.    |                                                       |
| 14512              | Wheat Bran .....                                        | McInnis Bros., Moss Point.....<br>Guarantee.....      |
|                    | <b>FREEBURG MILLING COMPANY,</b><br>Freeburg, Ill.      |                                                       |
| 14513              | Wheat Middlings .....                                   | T. E. Winn, Laurel.....<br>Guarantee.....             |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent.   | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|-----------------------|-------------------------|-------------------------|-----------------------|
| 14034              | 10.67              | 6.46          | 6.24                  | 13.50                   | 56.00                   | 7.13                  |
| 14506              | 8.68               | 6.18          | 4.91<br><i>3.95</i>   | 14.13<br><i>14.00</i>   | 58.70<br><i>55.00</i>   | 7.40<br><i>10.50</i>  |
| 14035              | 9.90               | 4.75          | 5.24<br><i>3.50</i>   | 20.13<br><i>10.00</i>   | 55.23<br><i>54.00</i>   | 4.75<br><i>10.50</i>  |
| 14507              | 8.12               | 6.65          | 5.66<br><i>3.50</i>   | 15.69<br><i>10.00</i>   | 53.11<br><i>54.00</i>   | 10.77<br><i>10.50</i> |
| 14038              | 12.83              | 5.84          | 5.21                  | 12.13                   | 59.84                   | 4.15                  |
| 14039              | 11.32              | 6.75          | 5.26                  | 13.94                   | 56.23                   | 6.50                  |
| 14040              | 11.00              | 4.29          | 4.85                  | 13.56                   | 60.08                   | 6.22                  |
| 14041              | 8.17               | 6.02          | 3.76                  | 13.38                   | 62.74                   | 5.93                  |
| 14042              | 10.17              | 6.45          | 4.53                  | 13.63                   | 58.87                   | 6.35                  |
| 14509              | 8.77               | 5.83          | 3.66                  | 12.81                   | 60.50                   | 8.43                  |
| 14510              | 9.86               | 7.50          | 4.07<br><i>4.00</i>   | 13.31<br><i>13.00</i>   | 57.88<br><i>55.00</i>   | 7.38<br><i>11.50</i>  |
| 14043              | 9.00               | 9.37          | 14.51<br><i>10.85</i> | 13.19<br><i>12.69</i>   | 44.39<br><i>49.35</i>   | 9.54<br><i>10.00</i>  |
| 14511              | 7.10               | 6.60          | 4.47<br><i>3.50</i>   | 14.50<br><i>14.00</i>   | 58.99<br><i>54.00</i>   | 8.34<br><i>9.05</i>   |
| 14512              | 8.59               | 6.09          | 5.10<br><i>3.50</i>   | 14.94<br><i>14.00</i>   | 58.03<br><i>40.00</i>   | 7.25<br><i>9.00</i>   |
| 14513              | 9.73               | 3.85          | 5.29<br><i>3.50</i>   | 16.56<br><i>13.50</i>   | 61.74<br><i>55.00</i>   | 2.83<br><i>5.00</i>   |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.                        |
|--------------------|--------------------------------------------------------------|-------------------------------------------------------|
|                    | <b>A. H. GEORGE &amp; COMPANY,</b><br>Meridian, Miss.        |                                                       |
| 14044              | George's Mixed Rice Shorts.....                              | Myer Bros., Meridian.....                             |
| 14045              | George's Mixed Rice Shorts.....                              | J. C. McClinton, Newton<br>Guarantee.....             |
| 14514              | George's Prepared Horse &<br>Mule Feed.....                  | A. H. George Co., Meridian<br>Guarantee.....          |
|                    | <b>B. F. GLOVER &amp; SONS COM. CO.,</b><br>New Orleans, La. |                                                       |
| 14046              | Rice Polish .....                                            | Columbia Grocery Co., Columbia.....                   |
| 14047              | Rice Polish .....                                            | The Lampton Co., Columbia.....                        |
| 14516              | Rice Polish .....                                            | The Hall Company, Laurel<br>Guarantee.....            |
|                    | <b>J. T. GIBBONS,</b><br>New Orleans, La.                    |                                                       |
| 14515              | Hominy Feed.....                                             | The Northern Feed Store, Biloxi<br>Guarantee.....     |
|                    | <b>THE GREAT WESTERN CEREAL CO.,</b><br>Chicago, Ill.        |                                                       |
| 14517              | Boss Feed .....                                              | L. A. Latham & Sons, Pontotoc.....                    |
| 14058              | Boss Feed .....                                              | B. Wolfe, Beulah.....                                 |
| 14059              | Boss Feed .....                                              | Greenwood Grocery Co., Greenwood.....                 |
| 14060              | Boss Feed .....                                              | Cohn Bros., Brookhaven.....                           |
| 14061              | Boss Feed .....                                              | Merchants Grocery Co., Brookhaven.....                |
| 14062              | Boss Feed .....                                              | Taylor-Wills Grocery Co., Jackson.....                |
| 14063              | Boss Feed .....                                              | J. P. Cox Merc. Co., Pinola.....                      |
| 14064              | Boss Feed .....                                              | W. T. Newman, Raymond.....                            |
| 14065              | Boss Feed .....                                              | B. Kullman & Co., Natchez.....                        |
| 14066              | Boss Feed .....                                              | New Albany Groc. Co., New Albany.....                 |
| 14067              | Boss Feed .....                                              | C. C. Richardson, Columbus.....                       |
| 14518              | Boss Feed .....                                              | Taylor-Wills Grocery Co., Jackson<br>Guarantee.....   |
| 14069              | Daisy Dairy Feed .....                                       | Taylor-Wills Grocery Co., Jackson<br>Guarantee.....   |
| 14070              | Durham Chop Feed .....                                       | I. Lowenberg & Co., Natchez.....                      |
| 14071              | Durham Chop Feed .....                                       | I. Lowenberg & Co., Natchez<br>Guarantee.....         |
| 14075              | Excelsior Feed .....                                         | R. L. Crook & Co., Vicksburg.....                     |
| 14076              | Excelsior Feed .....                                         | R. H. Green & Bro., Jackson<br>Guarantee.....         |
| 14077              | Grainfalfa .....                                             | Grenada Grocery Co., Grenada<br>Guarantee.....        |
| 14078              | Maizefalfa .....                                             | R. H. Green & Bro., Jackson<br>Guarantee.....         |
| 14079              | Sterling Scratch Feed .....                                  | Southern Commission Co., Greenville<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14044              | 10.11              | 5.58          | 11.17               | 11.81                   | 55.32                   | 6.01                  |
| 14045              | 10.04              | 4.82          | 10.05<br>3.50       | 11.56<br>10.00          | 60.20<br>50.00          | 3.33<br>6.50          |
| 14514              | 6.01               | 5.26          | 7.13<br>4.00        | 12.75<br>12.00          | 61.27<br>60.00          | 7.58<br>4.62          |
| 14046              | 10.33              | 4.43          | 11.33               | 11.81                   | 61.05                   | 1.05                  |
| 14047              | 10.27              | 4.12          | 10.60               | 12.06                   | 61.93                   | 1.02                  |
| 14516              | 8.29               | 3.70          | 10.10<br>10.17      | 10.75<br>10.53          | 66.44<br>62.40          | .72<br>1.20           |
| 14515              | 8.73               | 2.19          | 6.80<br>3.50        | 8.69<br>10.00           | 70.39<br>60.00          | 3.20<br>8.00          |
| 14517              | 7.48               | 3.40          | 4.49                | 10.75                   | 66.06                   | 7.82                  |
| 14058              | 7.85               | 3.98          | 5.53                | 10.44                   | 67.93                   | 4.27                  |
| 14059              | 10.46              | 2.98          | 5.23                | 12.81                   | 64.50                   | 4.02                  |
| 14060              | 9.46               | 3.26          | 5.94                | 12.69                   | 64.81                   | 3.84                  |
| 14061              | 9.74               | 3.58          | 5.65                | 11.63                   | 64.15                   | 5.25                  |
| 14062              | 8.35               | 3.46          | 4.24                | 12.50                   | 65.48                   | 5.97                  |
| 14063              | 9.09               | 4.44          | 5.39                | 13.00                   | 63.15                   | 4.93                  |
| 14064              | 7.78               | 5.71          | 5.55                | 11.94                   | 63.13                   | 5.89                  |
| 14065              | 8.73               | 6.20          | 4.82                | 12.31                   | 61.77                   | 6.17                  |
| 14066              | 8.42               | 4.79          | 6.09                | 13.69                   | 61.48                   | 5.53                  |
| 14067              | 9.55               | 3.11          | 5.41                | 9.50                    | 67.38                   | 5.05                  |
| 14518              | 8.18               | 4.30          | 5.58<br>4.00        | 13.38<br>9.50           | 63.38<br>60.00          | 5.18<br>10.00         |
| 14069              | 7.26               | 7.23          | 4.30<br>3.50        | 16.94<br>15.00          | 53.41<br>50.00          | 10.86<br>12.00        |
| 14070              | 10.06              | 2.75          | 3.82                | 9.56                    | 69.65                   | 4.16                  |
| 14071              | 8.38               | 3.98          | 5.86<br>4.00        | 13.38<br>9.50           | 63.60<br>60.00          | 4.80<br>10.00         |
| 14075              | 10.18              | 3.50          | 5.27                | 13.25                   | 64.89                   | 2.91                  |
| 14076              | 9.53               | 4.45          | 5.50<br>4.00        | 13.25<br>9.50           | 61.82<br>60.00          | 5.45<br>10.00         |
| 14077              | 10.78              | 4.12          | 3.51<br>4.00        | 10.50<br>10.00          | 65.98<br>60.00          | 5.11<br>11.00         |
| 14078              | 9.60               | 5.64          | 4.58<br>4.00        | 12.44<br>10.00          | 61.30<br>60.00          | 6.44<br>11.00         |
| 14079              | 9.48               | 2.48          | 3.37<br>3.50        | 10.81<br>10.00          | 72.03<br>65.00          | 1.83<br>4.00          |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                      | Where and from Whom Collected.                           |
|--------------------|------------------------------------------------------|----------------------------------------------------------|
|                    | <b>R. H. GREEN &amp; BROTHER,</b><br>Jackson, Miss.  |                                                          |
| 14080              | Wheat Shorts.....                                    | J. S. Allred, Hazlehurst.....<br>No guarantee submitted. |
|                    | <b>GULFPORT GROCERY COMPANY,</b><br>Gulfport, Miss.  |                                                          |
| 14083              | Mile Post .....                                      | Hattiesburg Grocery Co., Hattiesburg                     |
| 14084              | Mile Post .....                                      | W. M. Biglane, Collins.....                              |
| 14519              | Mile Post .....                                      | Buckley Terry Co., Laurel.....                           |
| 14085              | Nek-Yok .....                                        | Guarantee.....                                           |
| 14520              | Nek-Yok .....                                        | The Rankin Co., Columbia.....                            |
|                    |                                                      | Kennedy Bros., New Augusta.....                          |
|                    |                                                      | Guarantee.....                                           |
|                    | <b>H. L. HALLIDAY MILLING CO.,</b><br>Cairo, Ill.    |                                                          |
| 14086              | Wheat Bran .....                                     | Taylor-Wills Grocery Co., Jackson.....                   |
| 14087              | Wheat Bran .....                                     | Merchants Grocery Co., Hazlehurst.....                   |
| 14521              | Wheat Bran .....                                     | S. H. Story & Co., Forest.....                           |
|                    |                                                      | Guarantee.....                                           |
|                    | <b>HANNAH DISTRIBUTING CO.,</b><br>Jackson, Miss.    |                                                          |
| 14088              | Mixed Feed .....                                     | Fernwood Lumber Co., Fernwood.....                       |
| 14089              | Mixed Feed .....                                     | Hannah Distributing Co., Jackson.....                    |
| 14522              | Mixed Feed .....                                     | Hannah Distributing Co., Jackson.....                    |
|                    |                                                      | Guarantee.....                                           |
| 14090              | Rice Polish .....                                    | Hannah Distributing Co., Jackson.....                    |
|                    |                                                      | Guarantee.....                                           |
|                    | <b>HANOVER STAR MILLING CO.,</b><br>Germantown, Ill. |                                                          |
| 14523              | Middlings .....                                      | J. A. Spann & Co., Pelahatchie.....                      |
|                    |                                                      | Guarantee.....                                           |
|                    | <b>HARRIS &amp; COMPANY,</b><br>Meridian, Miss.      |                                                          |
| 14091              | Tip Top Cattle Feed .....                            | The Lampton Co., Columbia.....                           |
| 14524              | Tip Top Horse Feed .....                             | Guarantee.....                                           |
|                    |                                                      | Harris & Co., Meridian.....                              |
|                    |                                                      | Guarantee.....                                           |
|                    | <b>HARTFIELD &amp; COOK,</b><br>Memphis, Tenn.       |                                                          |
| 14525              | Old Miss. Stock Feed .....                           | Caldwell Bros., Ellisville.....                          |
|                    |                                                      | Guarantee.....                                           |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14080              | 8.84               | 5.02          | 5.40                | 17.06                   | 60.24                   | 3.44                  |
| 14083              | 10.62              | 4.23          | 3.53                | 11.75                   | 62.54                   | 7.33                  |
| 14084              | 9.85               | 4.39          | 3.81                | 12.94                   | 63.19                   | 5.82                  |
| 14519              | 9.50               | 5.78          | 3.09                | 12.25                   | 60.19                   | 9.19                  |
|                    |                    |               | 3.50                | 10.00                   | 57.50                   | 12.00                 |
| 14085              | 6.46               | 4.38          | 4.01                | 14.88                   | 54.65                   | 15.62                 |
| 14520              | 8.25               | 3.88          | 3.03                | 10.75                   | 49.64                   | 24.45                 |
|                    |                    |               | 3.50                | 10.00                   | 40.00                   | 25.00                 |
| 14086              | 9.10               | 6.85          | 4.45                | 16.44                   | 57.25                   | 5.91                  |
| 14087              | 9.64               | 9.35          | 4.51                | 16.31                   | 54.59                   | 5.60                  |
| 14521              | 9.43               | 5.70          | 4.33                | 15.75                   | 58.59                   | 6.20                  |
|                    |                    |               | 4.00                | 14.00                   | 55.00                   | 8.50                  |
| 14088              | 9.38               | 6.11          | 5.25                | 16.63                   | 56.68                   | 5.95                  |
| 14089              | 9.82               | 9.84          | 4.80                | 15.75                   | 55.31                   | 4.48                  |
| 14522              | 8.73               | 5.64          | 5.09                | 16.19                   | 58.53                   | 5.82                  |
|                    |                    |               | 3.50                | 10.00                   | 55.00                   | 12.00                 |
| 14090              | 9.61               | 4.81          | 10.28               | 12.19                   | 62.36                   | .75                   |
|                    |                    |               | 5.50                | 10.00                   | 50.00                   | 12.00                 |
| 14523              | 10.16              | 3.26          | 4.52                | 15.88                   | 63.66                   | 2.52                  |
|                    |                    |               | 4.25                | 14.60                   | 60.05                   | 10.42                 |
| 14091              | 7.38               | 4.28          | 3.77                | 14.44                   | 43.56                   | 26.57                 |
|                    |                    |               | 3.50                | 12.50                   | 29.24                   | 33.81                 |
| 14524              | 9.34               | 3.87          | 4.37                | 11.44                   | 64.01                   | 6.97                  |
|                    |                    |               | 3.85                | 11.00                   | 55.35                   | 11.95                 |
| 14525              | 10.47              | 6.54          | 3.07                | 13.50                   | 58.66                   | 7.76                  |
|                    |                    |               | 4.00                | 13.00                   | 55.00                   | 11.50                 |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                           | Where and from Whom Collected.                            |
|--------------------|---------------------------------------------------------------------------|-----------------------------------------------------------|
| 14526              | <b>HAZEL MILLING COMPANY,</b><br>East St. Louis, Ill.<br>Wheat Bran ..... | Gardner & Sanson, Okolona.....<br>Guarantee.....          |
|                    | <b>HUNTER BROS. MILLING CO.,</b><br>St. Louis, Mo.                        |                                                           |
| 14092              | Wheat Shorts.....                                                         | C. J. Edwards Co., Vicksburg.....                         |
| 14093              | Wheat Shorts.....                                                         | D. W. Wilkinson & Bro., Jackson.....                      |
| 14527              | Wheat Shorts.....                                                         | Winner-Klein Co., Meridian.....<br>Guarantee.....         |
|                    | <b>HUNTER-ROBINSON-WENZ MILL-<br/>ING COMPANY,</b><br>St. Louis, Mo.      |                                                           |
| 14094              | Wheat Bran .....                                                          | W. O. Worrell, Vicksburg.....                             |
| 14528              | Wheat Bran .....                                                          | The Northern Feed Store, Biloxi .....                     |
|                    |                                                                           | Guarantee.....                                            |
| 14095              | Wheat Middlings .....                                                     | Bogard & Harkins, Oxford.....                             |
| 14096              | Wheat Middlings.....                                                      | W. O. Worrell, Vicksburg.....<br>Guarantee.....           |
|                    | <b>HUTCHINSON ALFALFA PRODUCTS<br/>COMPANY,</b><br>Hutchinson, Kansas.    |                                                           |
| 14529              | Hapeo Horse & Mule Feed .....                                             | A. Seofide, Bay St. Louis.....<br>Guarantee.....          |
|                    | <b>ILLINOIS FEED MILLS,</b><br>St. Louis, Mo.                             |                                                           |
| 14097              | Star Feed .....                                                           | Delta Grocery & Cot. Co., Clarksdale                      |
| 14098              | Star Feed .....                                                           | Delta Grocery & Cot. Co., Clarksdale                      |
| 14099              | Star Feed .....                                                           | McMahon Grocery Co., Greenville.....                      |
| 14100              | Star Feed .....                                                           | W. E. Brown, Leland.....                                  |
| 14101              | Star Feed .....                                                           | G. A. Wilson, Jr., Greenwood.....                         |
| 14102              | Star Feed .....                                                           | McMahon Grocery Co., Greenville.....                      |
| 14530              | Star Feed .....                                                           | Delta Grocery & Cot. Co., Clarksdale ..<br>Guarantee..... |
|                    | <b>INTERSTATE MILLING COMPANY,</b><br>Memphis, Tenn.                      |                                                           |
| 14103              | Sugaration Stock Feed .....                                               | Moore & Co., Oakland.....                                 |
| 14104              | Sugaration Stock Feed .....                                               | Oakland Merc. Co., Oakland.....<br>Guarantee.....         |
| 14531              | "Katl Eat" Dairy Feed .....                                               | Durant Ice & Coal Co., Durant .....                       |
|                    |                                                                           | Guarantee.....                                            |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14526              | 7.21               | 6.23          | 4.61<br>3.55        | 16.25<br>14.30          | 58.22<br>54.00          | 7.48<br>9.00          |
| 14092              | 10.56              | 5.00          | 5.56                | 17.56                   | 57.27                   | 4.05                  |
| 14093              | 10.79              | 5.80          | 5.53                | 18.63                   | 55.37                   | 3.88                  |
| 14527              | 8.00               | 5.28          | 6.77<br>4.00        | 18.94<br>16.00          | 56.18<br>56.00          | 4.83<br>9.00          |
| 14094              | 9.60               | 5.43          | 3.83                | 15.38                   | 59.19                   | 6.57                  |
| 14528              | 6.90               | 7.16          | 5.21<br>3.50        | 15.69<br>14.50          | 56.71<br>50.00          | 8.33<br>9.50          |
| 14095              | 9.60               | 4.64          | 5.51                | 19.75                   | 57.19                   | 3.31                  |
| 14096              | 7.39               | 4.77          | 5.48<br>4.00        | 17.44<br>15.00          | 60.92<br>50.00          | 4.00<br>6.00          |
| 14529              | 8.10               | 4.40          | 3.58<br>4.00        | 12.44<br>12.00          | 62.19<br>58.00          | 9.29<br>11.00         |
| 14097              | 8.68               | 4.92          | 5.05                | 13.31                   | 62.03                   | 6.01                  |
| 14098              | 8.40               | 5.22          | 5.28                | 13.31                   | 62.67                   | 5.12                  |
| 14099              | 8.13               | 3.85          | 5.90                | 12.56                   | 63.66                   | 5.90                  |
| 14100              | 9.20               | 4.17          | 5.85                | 13.50                   | 61.53                   | 5.75                  |
| 14101              | 8.96               | 6.28          | 5.55                | 13.63                   | 58.41                   | 7.17                  |
| 14102              | 8.45               | 4.43          | 5.07                | 13.38                   | 63.41                   | 5.26                  |
| 14530              | 7.84               | 4.96          | 4.76<br>3.80        | 12.44<br>12.00          | 63.08<br>58.00          | 6.92<br>8.90          |
| 14103              | 7.75               | 6.48          | 3.24                | 11.31                   | 62.00                   | 9.22                  |
| 14104              | 8.32               | 6.18          | 3.03<br>3.60        | 11.44<br>11.65          | 62.40<br>64.40          | 8.63<br>11.40         |
| 14531              | 9.82               | 8.37          | 4.24<br>3.50        | 13.81<br>15.00          | 53.32<br>59.00          | 10.44<br>12.00        |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                            | Where and from Whom Collected.                         |
|--------------------|------------------------------------------------------------|--------------------------------------------------------|
|                    | <b>JONES &amp; RODGERS,</b><br>Memphis, Tenn.              |                                                        |
| 14105              | Croesus Feed .....                                         | J. T. Gabbert & Co., Senatobia.....<br>Guarantee.....  |
|                    | <b>KELLY MILLING COMPANY,</b><br>Kansas City, Mo.          |                                                        |
| 14532              | Wheat Shorts.....                                          | Jackson-Wallace Co., Kosciusko.....<br>Guarantee.....  |
|                    | <b>KEMPER MILL &amp; ELEVATOR CO.,</b><br>Kansas City, Mo. |                                                        |
| 14533              | Anchor Bran .....                                          | Union Naval Stores, Gulfport.....<br>Guarantee.....    |
|                    | <b>KOENIGSMARK MILLING CO.,</b><br>Waterloo, Ill.          |                                                        |
| 14534              | Wheat Middlings .....                                      | J. J. Rodgers & Sons, Tupelo.....<br>Guarantee.....    |
|                    | <b>KORNFALFA FEED MILLING CO.,</b><br>Kansas City, Mo.     |                                                        |
| 14535              | Kornfalfa .....                                            | Foote-Patrick Co., Laurel .....                        |
| 15272              | Kornfalfa .....                                            | Foote-Patrick Co., Laurel .....                        |
| 15273              | Kornfalfa .....                                            | J. S. Adkinson, McHenry.....                           |
| 15274              | Kornfalfa .....                                            | E. M. Fant & Co., Coahoma.....                         |
| 15275              | Kornfalfa .....                                            | Anderson Merc. Co., Richton.....                       |
| 15276              | Kornfalfa .....                                            | Union Naval Stores, Gulfport.....                      |
| 15277              | Kornfalfa .....                                            | Foote-Patrick Co., Laurel .....                        |
| 15278              | Kornfalfa .....                                            | Threefoot Bros. & Co., Meridian.....<br>Guarantee..... |
|                    | <b>HENRY A. KLYCE COMPANY,</b><br>Dyersburg, Tenn.         |                                                        |
| 15224              | Corn Chops.....                                            | Sol Fried & Co., Vicksburg .....                       |
| 15225              | Corn Chops.....                                            | C. J. Edwards, Vicksburg .....                         |
| 15226              | Corn Chops.....                                            | R. L. Crook & Co., Vicksburg .....                     |
| 15227              | Corn Chops.....                                            | W. O. Worrell, Vicksburg .....                         |
| 15228              | Corn Chops.....                                            | E. Bonelli Co., Vicksburg .....                        |
| 15229              | Corn Chops.....                                            | W. H. Miller Grocery Co., Vicksburg .....              |
| 14799              | Corn Chops.....                                            | A. J. Lyons & Co., Meridian.....                       |
| 15215              | Corn Chops.....                                            | Capital Grocery Co., Jackson .....                     |
| 15214              | Corn Chops.....                                            | R. H. Green & Bro., Jackson .....                      |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14105              | 10.65              | 5.69          | 6.06<br>4.50        | 10.94<br>13.50          | 62.48<br>55.00          | 4.18<br>9.00          |
| 14532              | 10.00              | 5.00          | 6.57<br>4.50        | 19.19<br>17.00          | 54.40<br>56.00          | 4.84<br>5.00          |
| 14533              | 9.31               | 6.47          | 4.68<br>4.00        | 17.44<br>14.50          | 53.75<br>53.50          | 8.35<br>9.50          |
| 14534              | 9.51               | 3.48          | 5.09<br>4.00        | 16.44<br>16.00          | 61.49<br>56.00          | 3.99<br>7.00          |
| 14535              | 9.08               | 4.06          | 3.06                | 10.69                   | 65.91                   | 7.20                  |
| 15272              | 10.65              | 4.01          | 3.81                | 12.19                   | 59.42                   | 9.92                  |
| 15273              | 10.06              | 4.47          | 3.54                | 12.81                   | 59.10                   | 10.02                 |
| 15274              | 13.79              | 2.81          | 3.20                | 12.00                   | 61.90                   | 6.30                  |
| 15275              | 12.34              | 3.83          | 3.14                | 11.94                   | 59.20                   | 9.55                  |
| 15276              | 12.81              | 3.39          | 1.79                | 12.00                   | 60.67                   | 9.34                  |
| 15277              | 13.76              | 3.47          | 3.26                | 11.19                   | 58.96                   | 9.36                  |
| 15278              | 11.06              | 4.04          | 3.20<br>3.50        | 11.88<br>11.00          | 60.56<br>60.00          | 9.26<br>12.00         |
| 15224              | 10.05              | 1.41          | 4.22                | 9.31                    | 72.23                   | 2.78                  |
| 15225              | 10.09              | 1.42          | 4.05                | 9.31                    | 70.86                   | 4.27                  |
| 15226              | 10.04              | 1.41          | 4.10                | 9.44                    | 72.02                   | 2.99                  |
| 15227              | 9.44               | 1.40          | 4.33                | 9.56                    | 71.07                   | 4.20                  |
| 15228              | 9.69               | 1.52          | 4.75                | 8.63                    | 70.67                   | 4.74                  |
| 15229              | 8.55               | 1.39          | 3.74                | 8.44                    | 73.91                   | 3.97                  |
| 14799              | 10.34              | 1.47          | 4.78                | 7.50                    | 70.99                   | 4.92                  |
| 15215              | 11.06              | 1.32          | 4.84                | 8.06                    | 71.65                   | 3.07                  |
| 15214              | 11.13              | 1.33          | 4.03                | 8.63                    | 71.88                   | 3.00                  |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                  | Where and from Whom Collected.                              |
|--------------------|------------------------------------------------------------------|-------------------------------------------------------------|
|                    | <b>LAWRENCE BROS. COMPANY,</b><br>Crowley, La.                   |                                                             |
| 14106              | Rice Polish .....                                                | W. E. Laird, Hattiesburg.....<br>Guarantee.....             |
|                    | <b>LAWRENCE &amp; HAMILTON FEED COMPANY,</b><br>New Orleans, La. |                                                             |
| 14107              | Stafo life .....                                                 | Walton Bros. & Co., Newton.....                             |
| 14108              | Stafo life .....                                                 | A. Beer & Co., Natchez.....                                 |
| 14109              | Stafo life .....                                                 | W. E. Laird, Hattiesburg.....                               |
| 14110              | Stafo life .....                                                 | Capital Grocery Co., Jackson.....                           |
| 14111              | Stafo life .....                                                 | A. Beer & Co., Natchez.....                                 |
| 14112              | Stafo life .....                                                 | Merchants Grocery Co., Crystal Spr'gs.....                  |
| 14536              | Stafo life .....                                                 | Ginn-McDonald Co., Tylertown.....                           |
| 14537              | Stafo life .....                                                 | Holmes Bros., McComb.....<br>Guarantee.....                 |
|                    | <b>LEONA RICE MILLING COMPANY,</b><br>New Orleans, La.           |                                                             |
| 14538              | Rice Bran .....                                                  | Threefoot Bros. & Co., Meridian.....<br>Guarantee.....      |
|                    | <b>LEVY RICE MILLING COMPANY,</b><br>New Orleans, La.            |                                                             |
| 14539              | Rice Polish .....                                                | R. Viener & Co., Natchez.....<br>Guarantee.....             |
|                    | <b>LEXINGTON FLOURING MILLS,</b><br>Lexington, Mo.               |                                                             |
| 14540              | Wheat Shorts.....                                                | Stonewall Cotton Mills, Stonewall.....<br>Guarantee.....    |
|                    | <b>LIBERTY MILLS,</b><br>Nashville, Tenn.                        |                                                             |
| 14113              | Wheat Bran .....                                                 | Clark & Tyler, Holly Springs.....<br>Guarantee.....         |
| 14114              | Wheat Shorts.....                                                | The Goyer Co., Greenville.....                              |
| 14115              | Wheat Shorts.....                                                | The Goyer Co., Greenville.....                              |
| 14541              | Wheat Shorts.....                                                | The Goyer Co., Greenville.....<br>Guarantee.....            |
|                    | <b>LOTTERHOS &amp; HUBER CO.,</b><br>Crystal Springs, Miss.      |                                                             |
| 14116              | Rice Polish .....                                                | Lotterhos & Huber Co., Crystal Sp'gs.....<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14106              | 8.34               | 5.05          | 11.43<br>10.50      | 11.94<br>11.37          | 61.89<br>61.55          | 1.35<br>1.75          |
| 14107              | 7.67               | 10.22         | 6.09                | 9.81                    | 55.73                   | 10.48                 |
| 14108              | 8.08               | 10.38         | 6.87                | 10.44                   | 53.95                   | 10.28                 |
| 14109              | 7.72               | 8.95          | 7.03                | 11.38                   | 54.32                   | 10.60                 |
| 14110              | 7.69               | 9.23          | 6.92                | 10.50                   | 55.04                   | 10.62                 |
| 14111              | 9.03               | 9.62          | 6.61                | 11.44                   | 51.14                   | 12.16                 |
| 14112              | 9.06               | 9.41          | 7.19                | 10.44                   | 52.83                   | 11.07                 |
| 14536              | 8.56               | 9.95          | 6.13                | 9.81                    | 54.45                   | 11.10                 |
| 14537              | 8.38               | 9.48          | 6.82<br>6.00        | 10.88<br>11.00          | 54.90<br>53.00          | 9.54<br>12.00         |
| 14538              | 7.53               | 12.15         | 9.32<br>8.87        | 9.38<br>11.44           | 52.84<br>53.55          | 8.78<br>9.37          |
| 14539              | 8.43               | 4.47          | 10.03<br>8.87       | 11.13<br>11.06          | 64.94<br>63.41          | 1.00<br>1.07          |
| 14540              | 8.79               | 4.59          | 6.21<br>5.77        | 17.88<br>16.55          | 58.02<br>58.01          | 4.51<br>4.33          |
| 14113              | 10.46              | 6.01          | 4.50<br>4.00        | 15.50<br>14.50          | 55.18<br>50.00          | 8.35<br>9.50          |
| 14114              | 9.20               | 4.34          | 4.91                | 18.25                   | 58.98                   | 4.32                  |
| 14115              | 10.76              | 4.48          | 5.10                | 18.19                   | 56.90                   | 4.57                  |
| 14541              | 8.93               | 4.83          | 5.02<br>4.00        | 17.94<br>16.00          | 58.31<br>48.00          | 4.97<br>6.00          |
| 14116              | 8.41               | 4.08          | 9.96<br>7.00        | 11.63<br>9.50           | 65.10<br>50.00          | .82<br>8.00           |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                             | Where and from Whom Collected.                               |
|--------------------|-------------------------------------------------------------|--------------------------------------------------------------|
|                    | <b>J. C. LYSLE MILLING COMPANY,</b><br>Leavenworth, Kansas. |                                                              |
| 14542              | Wheat Shorts.....                                           | J. D. Roberts & Co., Yazoo City.....<br>Guarantee.....       |
|                    | <b>GEO. B. MATHEWS &amp; SONS,</b><br>New Orleans, La.      |                                                              |
| 14117              | Rice Polish .....                                           | Merchants Grocery Co., Hazlehurst....<br>Guarantee.....      |
|                    | <b>MCCORD, CROCKETT &amp; KOLP,</b><br>Memphis, Tenn.       |                                                              |
| 14543              | Wheat Shorts.....                                           | Craig Bros., New Albany.....<br>Guarantee.....               |
|                    | <b>MEEK MILLING COMPANY,</b><br>Marissa, Ill.               |                                                              |
| 14544              | Wheat Bran .....                                            | Ruffin Merc. Co., Ellisville.....<br>No Guarantee submitted. |
| 14118              | Wheat Bran & Ground Wheat<br>Screenings.....                | Taylor Merc. Co., Como.....<br>Guarantee.....                |
| 14119              | Wheat Shorts.....                                           | Mrs. E. Kilpatrick, Columbus.....                            |
| 14120              | Wheat Shorts.....                                           | Newberger Merc. Co., Coffeeville.....<br>Guarantee.....      |
|                    | <b>MILLSTADT MILLING COMPANY,</b><br>Millstadt, Ill.        |                                                              |
| 14121              | Wheat Bran .....                                            | Threefoot Bros. & Co., Meridian.....<br>Guarantee.....       |
| 14545              | Wheat Middlings .....                                       | Loper Merc. Co., Lake.....<br>Guarantee.....                 |
|                    | <b>MOHLENBROCK MILLING CO.,</b><br>Campbell Hill, Ill.      |                                                              |
| 14546              | Mohlenbrock's Shorts .....                                  | Farmers Warehouse Co., Houston.....<br>Guarantee.....        |
|                    | <b>NATIONAL RICE MILLING CO.,</b><br>New Orleans, La.       |                                                              |
| 14547              | Rice Polish .....                                           | C. Atkinson's Sons Co., Summit.....<br>Guarantee.....        |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14542              | 6.58               | 4.65          | 5.76<br>4.50        | 19.81<br>14.50          | 59.20<br>54.00          | 4.00<br>8.00          |
| 14117              | 9.29               | 4.79          | 10.75<br>5.00       | 11.19<br>10.00          | 62.97<br>50.00          | 1.01<br>12.00         |
| 14543              | 7.52               | 4.64          | 5.26<br>3.50        | 17.75<br>10.00          | 60.56<br>50.00          | 4.27<br>12.00         |
| 14544              | 4.95               | 6.51          | 4.96                | 16.56                   | 59.37                   | 7.65                  |
| 14118              | 10.41              | 5.73          | 5.00<br>3.50        | 16.06<br>13.50          | 56.37<br>50.00          | 6.43<br>12.00         |
| 14119              | 10.34              | 3.56          | 4.65                | 15.69                   | 62.48                   | 3.28                  |
| 14120              | 10.36              | 4.26          | 4.53<br>3.50        | 16.06<br>13.50          | 62.65<br>54.00          | 2.14<br>8.50          |
| 14121              | 9.12               | 7.57          | 5.35<br>3.50        | 15.31<br>11.27          | 55.57<br>59.54          | 7.08<br>6.04          |
| 14545              | 7.66               | 3.48          | 4.68<br>3.50        | 16.69<br>12.35          | 64.64<br>72.80          | 2.85<br>1.23          |
| 14546              | 7.51               | 4.07          | 4.72<br>3.50        | 15.88<br>13.00          | 64.13<br>40.00          | 3.69<br>8.00          |
| 14547              | 6.60               | 4.36          | 10.96<br>11.00      | 10.88<br>11.63          | 65.98<br>60.05          | 1.22<br>1.60          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                        | Where and from Whom Collected.                          |
|--------------------|--------------------------------------------------------|---------------------------------------------------------|
|                    | <b>NEW ATHENS MILLING COMPANY,</b><br>New Athens, Ill. |                                                         |
| 14548              | Bran & Wheat Screenings<br>Mixed .....                 | Kennedy & Co., Wiggins.....<br>Guarantee.....           |
|                    | <b>NUTRILINE MILLING COMPANY,</b><br>Crowley, La.      |                                                         |
| 14123              | Nutriline .....                                        | Donaghue & Dee, Columbus.....                           |
| 14124              | Nutriline .....                                        | Merchants Grocery Co., Crystal Springs                  |
| 14125              | Nutriline .....                                        | Lotterhos & Huber Co., Crystal Sp'gs<br>Guarantee.....  |
|                    | <b>G. E. PATTESON &amp; COMPANY,</b><br>Memphis, Tenn. |                                                         |
| 14549              | Sugaration Stock Feed .....                            | Clark Grocery Co., Tupelo.....<br>Guarantee.....        |
|                    | <b>PEASE &amp; DWYER COMPANY,</b><br>Memphis, Tenn.    |                                                         |
| 14550              | Optime Feed .....                                      | Strong's Cash Grocery, Cleveland.....<br>Guarantee..... |
|                    | <b>GEO. P. PLANT MILLING CO.,</b><br>St. Louis, Mo.    |                                                         |
| 14126              | Wheat Bran .....                                       | Rumble & Wensel Co., Natchez.....                       |
| 14127              | Wheat Bran .....                                       | I. Lowenberg & Co., Natchez.....                        |
| 14128              | Wheat Bran .....                                       | A. Beer & Co., Natchez.....                             |
| 14129              | Wheat Bran .....                                       | Hanes & Hood, Vicksburg.....                            |
| 14551              | Wheat Bran .....                                       | Hanes & Hood, Vicksburg<br>Guarantee.....               |
| 14552              | Wheat Middlings .....                                  | Rumble & Wensel Co., Natchez.....<br>Guarantee.....     |
|                    | <b>PHOENIX FLOUR MILLS,</b><br>Evansville, Ind.        |                                                         |
| 14553              | Wheat Shorts.....                                      | H. A. Busick & Co., Brandon.....<br>Guarantee.....      |
|                    | <b>QUAKER OATS COMPANY,</b><br>Chicago, Ill.           |                                                         |
| 14140              | Banner Feed .....                                      | J. W. Ratcliff & Sons, Edwards.....                     |
| 14141              | Banner Feed .....                                      | P. P. Williams Co., Vicksburg.....                      |
| 14142              | Banner Feed .....                                      | P. P. Williams Co., Vicksburg.....                      |
| 14143              | Banner Feed .....                                      | The Goyer Company, Greenville.....                      |
| 14144              | Banner Feed .....                                      | Clark, Herrin, Campbell Co., Clarksdale                 |
| 14145              | Banner Feed .....                                      | R. Viener & Co., Natchez.....                           |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14548              | 8.25               | 5.42          | 5.10<br>3.50        | 16.00<br>14.00          | 58.68<br>55.00          | 6.55<br>9.50          |
| 14123              | 9.02               | 8.65          | 9.00                | 10.94                   | 54.99                   | 7.40                  |
| 14124              | 8.98               | 8.35          | 9.66                | 12.50                   | 51.53                   | 8.98                  |
| 14125              | 8.47               | 8.14          | 9.58<br>3.50        | 11.94<br>12.00          | 54.79<br>58.00          | 7.08<br>10.00         |
| 14549              | 10.43              | 6.44          | 3.76<br>3.50        | 11.88<br>11.65          | 58.38<br>64.00          | 9.11<br>11.04         |
| 14550              | 9.11               | 4.10          | 6.56<br>4.52        | 11.50<br>12.85          | 63.13<br>60.35          | 5.60<br>6.72          |
| 14126              | 9.42               | 5.94          | 4.42                | 15.31                   | 57.22                   | 7.69                  |
| 14127              | 9.56               | 6.58          | 4.66                | 17.69                   | 54.80                   | 7.71                  |
| 14128              | 9.88               | 5.72          | 4.48                | 16.25                   | 56.80                   | 6.87                  |
| 14129              | 8.49               | 6.71          | 4.67                | 17.44                   | 54.47                   | 8.22                  |
| 14551              | 8.35               | 6.56          | 4.62<br>4.00        | 16.13<br>16.00          | 55.42<br>54.00          | 8.92<br>9.00          |
| 14552              | 8.23               | 3.64          | 4.58<br>4.41        | 17.88<br>17.11          | 62.00<br>59.18          | 3.67<br>5.18          |
| 14553              | 8.90               | 3.59          | 4.69<br>4.00        | 16.56<br>14.50          | 62.21<br>55.00          | 4.05<br>7.00          |
| 14140              | 8.55               | 3.24          | 4.47                | 11.44                   | 66.13                   | 6.17                  |
| 14141              | 8.35               | 3.52          | 3.87                | 12.13                   | 65.92                   | 6.21                  |
| 14142              | 7.41               | 3.18          | 3.76                | 12.75                   | 68.14                   | 4.76                  |
| 14143              | 8.13               | 3.21          | 3.85                | 10.75                   | 67.66                   | 6.40                  |
| 14144              | 7.38               | 3.46          | 4.09                | 11.50                   | 67.89                   | 5.68                  |
| 14145              | 9.65               | 3.83          | 3.86                | 12.19                   | 64.21                   | 6.26                  |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                   | Where and from Whom Collected.                         |
|--------------------|---------------------------------------------------|--------------------------------------------------------|
| 14146              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....                  |
| 14147              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....                  |
| 14148              | Banner Feed .....                                 | P. P. Williams Co., Vicksburg.....                     |
| 14149              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....                  |
| 14150              | Banner Feed .....                                 | D. E. Shell & Bro., Houston.....                       |
| 14554              | Banner Feed .....                                 | Gaddis & McLaurin, Raymond.....                        |
| 14555              | Banner Feed .....                                 | Geisenberger & Friedler, Natchez.....                  |
| 14556              | Banner Feed .....                                 | J. H. Stafford, Stafford.....<br>Guarantee.....        |
| 14151              | Schumacher's Little Chick<br>Feed .....           | Geisenberger & Friedler, Natchez.....                  |
| 14152              | Schumacher's Little Chick<br>Feed .....           | P. P. Williams & Co., Vicksburg.....<br>Guarantee..... |
| 14153              | Schumacher's Scratching<br>Grains .....           | R. Viener & Co., Natchez.....                          |
| 14154              | Schumacher's Scratching<br>Grains .....           | Geisenberger & Friedler, Natchez.....                  |
| 14155              | Schumacher's Scratching<br>Grains .....           | P. P. Williams Co., Vicksburg.....<br>Guarantee.....   |
| 14156              | Schumacker's Special Horse<br>Feed .....          | S. N. Ely, Winona.....<br>Guarantee.....               |
|                    | <b>RALSTON PURINA COMPANY,<br/>St. Louis, Mo.</b> |                                                        |
| 14162              | Protена Feed .....                                | Rumble & Wensel Co., Natchez.....                      |
| 14163              | Protена Feed .....                                | Capital Grocery Co., Jackson.....                      |
| 14164              | Protена Feed .....                                | Rumble & Wensel Co., Natchez.....<br>Guarantee.....    |
| 14165              | Purina Feed .....                                 | The Goyer Company, Greenville.....                     |
| 14166              | Purina Feed .....                                 | Sol Fried, Vicksburg.....                              |
| 14167              | Purina Feed .....                                 | The Goyer Company, Greenville.....                     |
| 14168              | Purina Feed .....                                 | Rumble & Wensel Co., Natchez.....                      |
| 14169              | Purina Feed .....                                 | W. O. Worrell, Vicksburg.....                          |
| 14170              | Purina Feed .....                                 | Capital Grocery Co., Jackson.....                      |
| 14171              | Purina Feed .....                                 | Hattiesburg Grocery Co., Hattiesburg.....              |
| 14172              | Purina Feed .....                                 | Rumble & Wensel Co., Natchez.....                      |
| 14173              | Purina Feed .....                                 | C. A. Turner, Corinth.....                             |
| 14174              | Purina Feed .....                                 | Reeves Grocery Co., Tupelo.....                        |
| 14175              | Purina Feed .....                                 | Gray & Pearson, Houston.....                           |
| 14557              | Purina Feed .....                                 | A. M. Patterson & Co., Como.....                       |
| 14558              | Purina Feed .....                                 | L. G. and J. T. Montgomery, Yazoo C'y.....             |
| 14559              | Purina Feed .....                                 | Capital Grocery Co., Jackson.....<br>Guarantee.....    |
| 14176              | Poultry Feed .....                                | Hanes & Hood, Vicksburg.....                           |
| 14177              | Poultry Feed .....                                | The Goyer Co., Greenville.....                         |
| 14178              | Poultry Feed (Scratch Size) .....                 | Capital Grocery Co., Jackson.....<br>Guarantee.....    |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14146              | 9.96               | 3.22          | 3.64                | 11.38                   | 64.97                   | 6.88                  |
| 14147              | 9.60               | 3.64          | 3.90                | 11.88                   | 64.07                   | 6.91                  |
| 14148              | 10.66              | 3.42          | 3.88                | 11.44                   | 63.73                   | 6.87                  |
| 14149              | 8.83               | 3.18          | 4.44                | 10.81                   | 66.09                   | 6.65                  |
| 14150              | 7.62               | 3.42          | 3.51                | 10.38                   | 67.62                   | 7.45                  |
| 14554              | 7.61               | 2.85          | 4.08                | 10.63                   | 67.47                   | 7.36                  |
| 14555              | 7.46               | 3.47          | 4.12                | 11.00                   | 67.12                   | 6.83                  |
| 14556              | 7.38               | 3.38          | 5.02                | 10.56                   | 65.69                   | 7.97                  |
|                    |                    |               | 3.75                | 9.75                    | 63.00                   | 10.50                 |
| 14151              | 12.00              | 7.18          | 2.85                | 9.19                    | 67.38                   | 1.40                  |
| 14152              | 10.50              | 8.62          | 2.87                | 9.63                    | 67.14                   | 1.24                  |
|                    |                    |               | 3.50                | 10.50                   | 67.00                   | 3.00                  |
| 14153              | 11.35              | 1.88          | 3.54                | 10.63                   | 70.82                   | 1.78                  |
| 14154              | 11.28              | 1.67          | 3.75                | 10.56                   | 71.03                   | 1.71                  |
| 14155              | 11.01              | 1.83          | 4.27                | 10.88                   | 70.37                   | 1.64                  |
|                    |                    |               | 3.50                | 10.50                   | 64.00                   | 4.50                  |
| 14156              | 9.17               | 3.03          | 4.60                | 10.25                   | 67.58                   | 5.37                  |
|                    |                    |               | 4.00                | 10.00                   | 62.00                   | 8.00                  |
| 14162              | 9.52               | 5.11          | 6.09                | 12.56                   | 59.34                   | 7.38                  |
| 14163              | 10.00              | 4.50          | 5.53                | 11.75                   | 61.51                   | 6.71                  |
| 14164              | 7.36               | 5.63          | 5.73                | 13.13                   | 61.62                   | 6.53                  |
|                    |                    |               | 3.80                | 12.00                   | 58.00                   | 8.90                  |
| 14165              | 8.55               | 4.55          | 4.61                | 11.69                   | 63.13                   | 7.47                  |
| 14166              | 9.61               | 4.05          | 4.64                | 12.38                   | 62.70                   | 6.62                  |
| 14167              | 7.19               | 4.28          | 5.88                | 12.69                   | 63.49                   | 6.47                  |
| 14168              | 10.13              | 5.23          | 5.35                | 11.94                   | 62.26                   | 5.09                  |
| 14169              | 9.74               | 4.40          | 4.33                | 12.19                   | 62.97                   | 6.37                  |
| 14170              | 8.93               | 4.75          | 4.50                | 12.31                   | 64.75                   | 4.76                  |
| 14171              | 9.44               | 4.40          | 4.44                | 11.81                   | 63.14                   | 6.77                  |
| 14172              | 8.04               | 4.17          | 5.86                | 12.06                   | 63.71                   | 6.16                  |
| 14173              | 6.94               | 4.82          | 4.93                | 12.25                   | 63.73                   | 7.33                  |
| 14174              | 9.07               | 3.84          | 4.41                | 12.06                   | 64.47                   | 6.15                  |
| 14175              | 10.18              | 4.06          | 4.80                | 12.06                   | 61.76                   | 7.14                  |
| 14557              | 8.52               | 4.48          | 4.35                | 11.38                   | 64.08                   | 7.19                  |
| 14558              | 8.61               | 4.59          | 5.24                | 12.06                   | 62.96                   | 6.54                  |
| 14559              | 10.90              | 4.60          | 4.46                | 12.00                   | 60.76                   | 7.28                  |
|                    |                    |               | 4.00                | 12.50                   | 58.00                   | 8.90                  |
| 14176              | 10.57              | 1.70          | 3.66                | 10.81                   | 71.11                   | 2.15                  |
| 14177              | 11.56              | 2.31          | 4.07                | 10.56                   | 68.75                   | 2.75                  |
| 14178              | 10.42              | 2.30          | 4.06                | 10.81                   | 70.10                   | 2.31                  |
|                    |                    |               | 3.60                | 11.00                   | 65.00                   | 4.00                  |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                          |
|--------------------|---------------------------------------------------------|---------------------------------------------------------|
|                    | <b>RANDOLPH MILLING COMPANY,</b><br>Baldwin, Ill.       |                                                         |
| 14157              | Randolph Bran .....                                     | A. W. Allen, Tupelo.....<br>Guarantee.....              |
|                    | <b>REFUGE COTTON OIL COMPANY,</b><br>Columbus, Miss.    |                                                         |
| 14158              | Mr. Durham Cow & Ox Feed .....                          | J. H. Shepherd, Houston.....                            |
| 14560              | Mr. Durham Cow & Ox Feed .....                          | Houston Ice & Coal Co., Houston.....<br>Guarantee.....  |
|                    | <b>REICHERT MILLING COMPANY,</b><br>Freeburg, Ill.      |                                                         |
| 14159              | Wheat Bran .....                                        | Sam Jones, McCool.....<br>Guarantee.....                |
| 14160              | Fancy Middlings .....                                   | Sam Jones, McCool.....<br>Guarantee.....                |
|                    | <b>ROBERT &amp; HAMNER GRAIN CO.,</b><br>Memphis, Tenn. |                                                         |
| 14161              | Bran .....                                              | W. W. Harris & Co., Iuka.....<br>Guarantee.....         |
| 14561              | Graino Alfalfa Mixed Feed .....                         | Barbee & Gorm, Cleveland.....<br>Guarantee.....         |
|                    | <b>ST. MARY'S MILL COMPANY,</b><br>St. Mary, Mo.        |                                                         |
| 14562              | Wheat Middlings .....                                   | Seward & Co., Ackerman.....<br>Guarantee.....           |
|                    | <b>SAXONY MILLS,</b><br>St. Louis, Mo.                  |                                                         |
| 14563              | Wheat Bran .....                                        | R. Schumaker, Holly Springs.....<br>Guarantee.....      |
|                    | <b>SHANKS PHILLIPS &amp; COMPANY,</b><br>Memphis, Tenn. |                                                         |
| 14564              | Wheat Bran .....                                        | J. E. Stewart, Louisville.....<br>Guarantee.....        |
|                    | <b>SPARKS MILLING COMPANY,</b><br>Alton, Ill.           |                                                         |
| 14247              | "Try Me" Wheat Bran.....                                | A. L. McCormick, Senatobia.....                         |
| 14565              | "Try Me" Wheat Bran.....                                | Connell & Garner Co., Clarksdale.....<br>Guarantee..... |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14157              | 8.45               | 6.60          | 5.74<br>3.50        | 15.56<br>14.50          | 54.41<br>50.00          | 9.24<br>10.62         |
| 14158              | 6.31               | 7.48          | 5.31                | 16.06                   | 47.59                   | 17.25                 |
| 14560              | 9.50               | 6.95          | 4.68<br>3.50        | 14.38<br>13.00          | 46.34<br>50.00          | 18.15<br>20.00        |
| 14159              | 8.23               | 6.81          | 5.33<br>4.50        | 16.44<br>15.50          | 55.89<br>55.00          | 7.30<br>9.00          |
| 14160              | 9.62               | 2.89          | 4.24<br>4.00        | 16.00<br>16.00          | 64.81<br>56.00          | 2.44<br>8.00          |
| 14161              | 7.37               | 5.80          | 5.19<br>3.75        | 17.50<br>14.50          | 57.29<br>50.00          | 6.85<br>10.00         |
| 14561              | 8.46               | 4.17          | 4.02<br>4.00        | 13.25<br>12.00          | 61.00<br>54.00          | 9.10<br>10.00         |
| 14562              | 9.30               | 3.40          | 5.57<br>4.20        | 16.88<br>15.81          | 62.10<br>62.37          | 2.75<br>2.90          |
| 14563              | 8.63               | 6.41          | 5.10<br>3.50        | 17.88<br>12.00          | 54.80<br>52.00          | 7.18<br>10.00         |
| 14564              | 8.86               | 5.61          | 5.03<br>3.50        | 16.31<br>10.00          | 57.90<br>50.00          | 6.29<br>12.00         |
| 14247              | 9.91               | 5.52          | 4.58                | 18.69                   | 55.81                   | 5.49                  |
| 14565              | 8.12               | 5.51          | 4.81<br>4.25        | 16.94<br>15.00          | 58.15<br>50.00          | 6.47<br>10.00         |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.                            |
|--------------------|--------------------------------------------------------------|-----------------------------------------------------------|
|                    | <b>STANDARD TILTON MILLING CO.,</b><br>St. Louis, Mo.        |                                                           |
| 14566              | Wheat Middlings .....                                        | R. H. Green & Bro., Jackson.....<br>Guarantee.....        |
|                    | <b>STEELEVILLE MILLING COMPANY,</b><br>Steeleville, Ill.     |                                                           |
| 14567              | Steeleville Middlings .....                                  | B. F. Youngblood & Co., Wesson.....<br>Guarantee.....     |
|                    | <b>TENNESSEE FIBER COMPANY,</b><br>Memphis, Tenn.            |                                                           |
| 14181              | Creamo Brand Feed Meal,<br>Cow and Ox .....                  | Union Naval Stores, Gulfport.....                         |
| 14182              | Creamo Brand Feed Meal,<br>Cow and Ox .....                  | DeJean Mitchell Co., Scranton.....                        |
| 14568              | Creamo Brand Feed Meal,<br>Cow and Ox .....                  | J. K. Dunn, McComb.....<br>Guarantee.....                 |
|                    | <b>THREEFOOT BROS. &amp; CO.,</b><br>Meridian, Miss.         |                                                           |
| 14569              | Mixed Feed .....                                             | Threefoot Bros. & Co., Meridian.....<br>Guarantee.....    |
|                    | <b>TUTT-MILLSPAUGH GRAIN CO.,</b><br>Meridian, Miss.         |                                                           |
| 14570              | "Oxlife" Cow and Ox Feed .....                               | Tutt-Millspaugh Grain Co., Meridian....<br>Guarantee..... |
|                    | <b>UNION CITY GRAIN &amp; FEED CO.,</b><br>Union City, Tenn. |                                                           |
| 14571              | Tenn. Hen Feed .....                                         | C. F. Palmer, Blue Mountain .....                         |
| 14572              | Tenn. Dairy Feed, Cow & Ox ..                                | C. W. McKnight, Iuka.....<br>Guarantee.....               |
|                    | <b>JOHN WADE &amp; SONS,</b><br>Memphis, Tenn.               |                                                           |
| 14183              | Wheat Bran .....                                             | Thomas & Perry, Grenada.....<br>Guarantee.....            |
| 14573              | Purity Feed .....                                            | G. Lowenberg & Co., Kosciusko.....<br>Guarantee.....      |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14566              | 9.24               | 3.98          | 5.00<br>5.00        | 17.75<br>16.00          | 59.12<br>40.00          | 4.91<br>7.00          |
| 14567              | 9.80               | 3.62          | 4.54<br>4.00        | 15.44<br>15.00          | 62.75<br>55.00          | 3.85<br>5.00          |
| 14181              | 8.84               | 4.70          | 5.26                | 21.75                   | 39.48                   | 19.97                 |
| 14182              | 9.67               | 4.68          | 4.41                | 21.31                   | 40.02                   | 19.91                 |
| 14568              | 7.76               | 4.42          | 5.02<br>5.00        | 21.56<br>20.00          | 41.60<br>36.00          | 19.64<br>25.00        |
| 14569              | 8.29               | 7.32          | 9.66<br>5.00        | 11.31<br>9.25           | 57.17<br>61.00          | 6.25<br>8.50          |
| 14570              | 9.35               | 4.24          | 3.35<br>3.50        | 14.50<br>12.50          | 45.58<br>32.20          | 22.98<br>30.84        |
| 14571              | 8.93               | 6.08          | 3.70<br>3.70        | 9.25<br>10.00           | 69.86<br>70.00          | 2.18<br>2.30          |
| 14572              | 8.38               | 4.48          | 4.07<br>3.50        | 10.50<br>10.00          | 65.75<br>55.00          | 6.82<br>15.00         |
| 14183              | 8.50               | 7.00          | 5.39<br>3.50        | 14.88<br>10.00          | 55.81<br>50.00          | 8.42<br>12.00         |
| 14573              | 9.10               | 2.54          | 4.27<br>4.25        | 9.88<br>9.25            | 69.28<br>65.00          | 4.93<br>5.50          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                     | Where and from Whom Collected.      |
|--------------------|-----------------------------------------------------|-------------------------------------|
| 14184              | Wheat Shorts .....                                  | Pollard & Duggar, Batesville.....   |
| 14185              | Wheat Shorts .....                                  | J. V. Sargent, Ackerman.....        |
| 14186              | Wheat Shorts .....                                  | Jackson-Wallace Co., Kosciusko..... |
| 14187              | Wheat Shorts .....                                  | Skillman Bros., Corinth.....        |
|                    |                                                     | Guarantee.....                      |
|                    | <b>WASHBURN-CROSBY COMPANY.</b>                     |                                     |
|                    | Minneapolis, Minn.                                  |                                     |
| 14188              | Standard Middlings .....                            | T. J. Howard, Iuka.....             |
| 14189              | Standard Middlings .....                            | Aldridge & Whithead, Winona.....    |
|                    |                                                     | Guarantee.....                      |
|                    | <b>WEBB &amp; MAURY.</b>                            |                                     |
|                    | Memphis, Tenn.                                      |                                     |
| 14190              | Wheat Bran .....                                    | G. W. McKnight, Iuka .....          |
|                    |                                                     | Guarantee.....                      |
| 14574              | Memphi Stock Feed .....                             | J. J. Pleasants, Clarksdale.....    |
| 14575              | Memphi Stock Feed .....                             | Oxford Supply Co., Oxford.....      |
|                    |                                                     | Guarantee.....                      |
|                    | <b>YATES &amp; DONELSON COMPANY.</b>                |                                     |
|                    | Memphis, Tenn.                                      |                                     |
| 14191              | Wheat Bran .....                                    | R. H. Green & Bro., Jackson.....    |
| 14576              | Wheat Bran .....                                    | W. F. Funches & Co., Osyka.....     |
|                    |                                                     | Guarantee.....                      |
|                    | <b>J. ZIMMERN'S COMPANY.</b>                        |                                     |
|                    | Mobile, Ala.                                        |                                     |
| 14577              | Zimmern's Alfalfa, Molasses.<br>Corn and Oats ..... | L. Lopez & Co., Biloxi.....         |
|                    |                                                     | Guarantee.....                      |

## Collected by State Chemist, Season 1909-1910.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 14184              | 10.75              | 3.92          | 4.72                | 16.50                   | 60.58                   | 3.53                  |
| 14185              | 10.20              | 4.88          | 3.73                | 17.00                   | 59.92                   | 4.27                  |
| 14186              | 11.14              | 4.28          | 5.13                | 17.50                   | 57.52                   | 4.43                  |
| 14187              | 10.11              | 5.65          | 5.97                | 17.81                   | 53.20                   | 7.26                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 12.00                 |
| 14188              | 9.78               | 4.83          | 5.58                | 18.00                   | 55.06                   | 6.75                  |
| 14189              | 10.67              | 4.76          | 5.35                | 17.81                   | 54.62                   | 6.79                  |
|                    |                    |               | 4.00                | 15.00                   | 55.00                   | 8.00                  |
| 14190              | 10.70              | 4.28          | 4.93                | 17.06                   | 56.96                   | 6.07                  |
|                    |                    |               | 3.50                | 10.00                   | 50.00                   | 12.00                 |
| 14574              | 9.63               | 5.19          | 4.53                | 14.19                   | 58.82                   | 7.64                  |
| 14575              | 9.83               | 4.76          | 4.60                | 16.19                   | 56.05                   | 8.57                  |
|                    |                    |               | 3.50                | 10.00                   | 40.00                   | 12.00                 |
| 14191              | 10.37              | 4.93          | 4.65                | 16.56                   | 58.14                   | 5.35                  |
| 14576              | 9.15               | 6.54          | 4.52                | 15.50                   | 55.79                   | 8.50                  |
|                    |                    |               | 3.58                | 14.85                   | 54.60                   | 10.00                 |
| 14577              | 12.85              | 5.36          | 3.59                | 10.44                   | 62.35                   | 5.41                  |
|                    |                    |               | 3.90                | 10.25                   | 55.17                   | 7.65                  |



# Mississippi Agricultural Experiment Station

Agricultural College, Mississippi

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BULLETIN No. 145.

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## INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS.

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI

DECEMBER, 1910.

MISSISSIPPI FERTILIZER AND FEEDING STUFFS CONTROL.

Inspection and Analyses of Feeding Stuffs.

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INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS.

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Season 1909-1910.  
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DECEMBER, 1910.

This bulletin completes the report of the inspection of feeding stuffs for the season of 1909-1910. The table contains the results of the analyses of 205 samples. The feeding stuffs law requires that four bulletins be issued each year or season.

Inspectors are now on the road and a large number of samples will be drawn and analyzed during the season of 1910-1911 (October 1910 to October 1911).

These analyses of samples of shipments in the possession of dealers are sufficient to demonstrate that shippers generally are supplying the trade with products conforming to the guaranties made for them. Comparatively few material deficiencies can be found in the table of analyses.

When samples are found deficient, the manufacturer or original seller is notified at once, that oversights and errors may be remedied without delay.

The feeding stuffs law became effective in July 1908. The analyses published this season exhibit comparatively few deficiencies as compared to the number brought to light during the first season, 1908-1909. Dealers found handling feeds which show a tendency to fall under the guaranties made for them are warned of their responsibility under the law.

An elementary discussion of the composition and digestibility of feeds, computation of rations, suggestions concerning the purchase of feeds, and general results of the inspection etc., will be found in Bulletin No. 144.

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ABBEVILLE RICE MILL COMPANY, Abbeville, La.	
13611	Rice Polish.....	Merchants Grocery Co., Hazlehurst....
13786	Rice Polish.....	Merchants Grocery Co., Hattiesburg....
		Guarantee.....
	ALFALFA PRODUCTS COMPANY, Jackson, Miss.	
13612	Uno Horse Feed	D. W. Wilkinson & Bro., Jackson.....
13613	Uno Horse Feed	Alfalfa Products Co., Jackson.....
		Guarantee.....
	AMERICAN MILLING COMPANY, Chicago, Ill.	
13990	Sucrene Alfalfa Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
13991	Sucrene Alfalfa Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
		Guarantee.....
13995	Sucrene Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
13996	Sucrene Horse & Mule Feed	P. P. Williams Co., Vicksburg.....
		Guarantee.....
	BALLARD & BALLARD COMPANY, Louisville, Ky.	
13622	Ballard's Shipstuff	J. S. Allred, Hazlehurst.....
		Guarantee.....
	C. BECKER MILLING COMPANY, Red Bud, Ill.	
13623	Wheat Bran	Gulfport Grocery Co., Gulfport.....
		Guarantee.....
	BLAIR MILLING COMPANY, Atchison, Kansas.	
13624	Blair's Shorts	Taylor Wills Grocery Co., Jackson.....
		Guarantee.....
	BROWDER MILLING COMPANY, Fulton, Ky.	
13625	Mixed Feed	Merchants Grocery Co., Water Valley
13626	Mixed Feed	Merchants Grocery Co., Crystal Sp'gs
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates Per Cent.	Crude Fiber—Per Cent.
13611	9.80	4.98	10.35	11.56	61.69	1.62
13786	8.78	4.96	11.24 6.00	11.13 10.00	62.53 65.00	1.36 10.00
13612	9.65	4.18	4.67	13.81	58.30	9.39
13613	8.06	6.15	4.27 4.00	13.50 14.00	57.12 52.00	10.90 12.00
13990	8.28	5.00	3.29	12.25	62.43	8.75
13991	9.20	5.83	4.07 3.50	12.31 10.00	60.21 50.00	8.38 12.00
13995	7.61	5.76	3.69	9.31	65.18	8.45
13996	9.63	6.68	3.69 3.50	9.50 10.00	60.76 50.00	9.74 12.00
13622	10.79	3.43	4.60 3.75	14.94 15.69	62.71 55.00	3.53 6.87
13623	6.76	6.40	4.57 3.58	16.31 14.50	58.46 52.00	7.50 10.00
13624	9.05	5.00	4.69 3.50	17.88 14.50	58.83 56.00	4.55 9.00
13625	9.64	5.22	5.87	17.38	56.36	5.53
13626	8.11	5.08	5.56 4.25	17.63 15.00	57.60 54.00	6.02 9.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
14249	W. P. BROWN & COMPANY, Memphis, Tenn. Bran	Sledge & Wesson, Como..... Guarantee.....
13627	CAPITAL CITY OIL COMPANY, Baton Rouge, La. Bestever Horse Feed	Delta Grocery Co., Clarksdale..... Guarantee.....
13628	CAPITAL GROCERY COMPANY, Jackson, Miss. Corn Chops.....	Summers Bros., Morton..... (No Guarantee submitted.)
13629	CHARLESTON MILLING CO., Charleston, Mo. Bran	E. Bonelli & Co., Vicksburg
13630	Corn Chops.....	Guarantee.....
13631	Corn Chops.....	A. G. Russell Co., Vicksburg
	CHAPIN & COMPANY, St. Louis, Mo. Wheat Bran	R. L. Crook & Co., Vicksburg
		Guarantee.....
13632	Wheat Bran	A. J. Lyons & Co., Meridian.....
13633	Wheat Bran	D. W. Wilkinson & Bro., Jackson.....
13634	Wheat Middlings	Guarantee.....
13635	Wheat Middlings	Myer Bros., Meridian.....
		Queen City Feed Store, Meridian.....
	COLUMBIA STAR MILLING CO., Columbia, Ill. Wheat Bran	Guarantee.....
13636	Wheat Bran	M. M. Moody, Long Beach.....
13637	Wheat Bran	Davis Bros., Ocean Springs.....
13638	Wheat Middlings	Guarantee.....
	CORNO MILLS COMPANY, St. Louis, Mo. Corno Hen Feed	The Fair Co., Louisville.....
13640	Corno Hen Feed	Guarantee.....
13641	Corno Hen Feed	P. P. Williams & Co., Vicksburg.....
13642	Corno Hen Feed	The Hall Co., Laurel.....
13643	Corno Hen Feed	Moody & Allen, Pass Christian.....
14470	Corno Hen Feed	Greenwood Grocery Co., Greenwood.....
14471	Corno Hen Feed	Hannah Distributing Co., Jackson.....
		The Hall Co., Laurel.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
14249	8.75	6.47	4.33 3.50	15.81 12.50	56.40 54.10	8.24 10.00
13627	7.41	5.78	3.13 3.50	14.13 13.00	57.69 50.00	11.86 11.00
13628	9.93	2.43	4.38	8.31	72.15	2.80
13629	9.43	4.87	5.10 4.75	15.25 13.10	59.52 54.50	5.83 9.20
13630	10.53	1.36	4.74	7.06	75.24	1.07
13631	11.98	1.89	4.37 3.65	7.19 12.00	73.37 64.34	1.20 2.87
13632	10.45	7.20	4.36	17.06	54.20	6.73
13633	9.16	7.51	4.92 3.50	16.25 14.00	54.71 40.00	7.45 10.00
13634	10.29	5.22	6.60	18.25	55.44	4.20
13635	9.50	4.40	6.35 5.00	18.63 14.00	56.97 40.00	4.15 10.00
13636	9.64	5.99	4.87	16.63	57.06	5.81
13637	7.95	7.23	5.24 3.74	16.69 15.26	55.57 53.38	7.32 9.21
13638	10.66	3.87	4.32 5.02	15.69 15.26	62.24 60.47	3.22 3.75
13640	11.66	1.50	3.17	10.81	71.29	1.57
13641	12.53	1.52	3.85	11.38	69.02	1.70
13642	12.89	1.48	3.38	11.50	69.47	1.28
13643	11.64	1.65	3.51	11.31	70.21	1.68
14470	10.93	1.53	3.21	10.63	72.10	1.60
14471	10.31	1.64	3.16 3.70	11.38 10.00	71.47 70.00	2.04 2.30

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13644	Corno Horse & Mule Feed	Hannah Distributing Co., Jackson.....
13645	Corno Horse & Mule Feed	Postlethwaite Stewart & Co., Natchez.....
13646	Corno Horse & Mule Feed	P. P. Williams & Co., Vicksburg.....
13647	Corno Horse & Mule Feed	Merchants Grocery Co., Hazlehurst.....
13648	Corno Horse & Mule Feed	J. L. Walker & Co., Columbus.....
13649	Corno Horse & Mule Feed	Walter Fisher Co., West Point.....
13650	Corno Horse & Mule Feed	Greenwood Grocery Co., Greenwood.....
13651	Corno Horse & Mule Feed	Crawford Grocery Co., Greenville.....
13652	Corno Horse & Mule Feed	Belzonía Grocery Co., Belzonía.....
		Guarantee.....
13653	Creamo Dairy Feed.....	Greenwood Grocery Co., Greenwood.....
		Guarantee.....
	CUMBERLAND MILLS, Nashville, Tenn.	
13654	Wheat Shorts.....	Gibson Grocery Co., West Point.....
		Guarantee.....
	DAHNIKE-WALKER MILLING COMPANY, Union City, Tenn.	
13655	Wheat Bran	F. Gardina, Greenville.....
13656	Wheat Bran	Merchants Grocery Co., Hattiesburg.....
13657	Wheat Bran	Hattiesburg Grocery Co., Hattiesburg.....
		Guarantee.....
13658	Wheat Shorts.....	Merchants Grocery Co., Hattiesburg.....
13659	Wheat Shorts.....	Reeves Grocery Co., Tupelo.....
13660	Wheat Shorts.....	Burrow & Co., Saltillo.....
*15347	Wheat Shorts.....	Winner Klein & Co., Meridian
*15348	Wheat Shorts.....	Myer Bros., Meridian
		Guarantee.....
	DEAN MILL COMPANY, Ava, Ill.	
13661	Wheat Bran	J. D. Brown, Pontotoc.....
		Guarantee.....
	DROGE BROS. ELEVATOR, Council Bluffs, Iowa.	
13662	Corn Chops.....	Winner-Klein Co., Meridian.....
		(No Guarantee submitted.)
	DUNLAP MILLING COMPANY, Clarksville, Tenn.	
13663	Wheat Bran	W. E. Laird, Hattiesburg.....
		Guarantee.....

*Labeled wheat shorts but found to be adulterated with corn product. Unsold portion of shipment returned.

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13644	8.79	3.90	4.21	11.06	64.82	7.22
13645	9.13	4.52	3.29	12.00	61.67	9.39
13646	7.96	3.98	3.93	11.25	64.60	8.28
13647	8.11	3.77	4.22	11.25	64.35	8.30
13648	6.88	3.43	3.63	10.56	66.82	8.68
13649	8.82	3.73	3.88	10.56	65.69	7.32
13650	8.22	4.33	3.50	11.56	64.31	8.08
13651	8.86	3.64	3.37	11.19	65.94	7.00
13652	8.43	3.83	3.59	11.44	64.13	8.58
			3.50	10.00	58.50	12.00
13653	6.44	6.19	5.73	21.06	44.56	16.02
			5.00	14.50	45.00	19.50
13654	8.89	4.46	5.55	17.69	58.56	4.85
			4.00	16.00	48.00	6.00
13655	9.13	4.36	5.43	13.94	59.97	7.17
13656	8.37	5.58	5.31	15.06	58.43	7.25
13657	7.67	6.04	5.26	15.38	57.97	7.68
			3.95	14.00	55.00	10.50
13658	10.60	3.83	4.55	15.06	62.08	3.88
13659	9.45	4.06	4.95	14.94	62.55	4.05
13660	11.92	3.44	4.51	15.19	61.66	3.28
15347						
15348			4.85	13.75	62.00	7.50
13661	7.39	6.04	4.69	15.69	58.73	7.46
			3.50	14.00	54.00	10.00
13662	14.86	1.02	2.84	7.81	71.89	1.58
13663	10.39	5.93	4.25	15.00	56.78	7.65
			4.00	14.00	55.00	10.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
J. B. EDGAR GRAIN COMPANY. Memphis, Tenn.		
13664	Ceralfa Stock Feed	Crawford Grocery Co., Greenville.....
13665	Ceralfa Stock Feed	Yazoo Grocery Co., Yazoo City.....
14036	Ceralfa Stock Feed	Planters Supply Co., Greenwood.....
14037	Ceralfa Stock Feed	R. L. Crook & Co., Vicksburg Guarantee.....
EMPIRE RICE MILL COMPANY. New Orleans, La.		
13666	Rice Bran	Bay Grain Co., Bay St. Louis..... Guarantee.....
FREEBURG MILLING COMPANY. Freeburg, Ill.		
13667	Wheat Middlings	Foote-Patrick Co., Laurel..... Guarantee.....
A. H. GEORGE & COMPANY. Meridian, Miss.		
13668	George's Prepared Cow & Cat- tle Feed.....	Lyndon Lumber Co., Wingate..... Guarantee.....
J. T. GIBBONS, New Orleans, La.		
13669	Wheat Bran	Pass Christian Feed Store, Pass C'tian Guarantee.....
13670	Hominy Feed	Columbia Grocery Co., Columbia..... Guarantee.....
13671	Rice Bran	Hood Milling Co., Gulfport..... Guarantee.....
13672	Rice Polish	Hood Milling Co., Gulfport..... Guarantee.....
B. F. GLOVER & SON COM. CO.. New Orleans, La.		
13609	Cow Feed (Corn Meal)	D. Carver Merc. Co., Bay St. Louis..... (No Guarantee submitted.)
13673	Chops	D. Carver Merc. Co., Bay St. Louis.....
13674	Chops	McInnis & Stevenson, Poplarville.....
13675	Chops	Foote-Patrick Co., Laurel..... (No Guarantee submitted.)
13676	Rice Bran	Hattiesburg Grocery Co., Hattiesburg Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13664	8.11	6.41	3.56	12.06	62.00	7.86
13665	8.09	6.65	4.13	12.94	60.51	7.68
14036	10.71	7.74	4.57	12.75	58.28	5.95
14037	11.14	7.86	4.51	13.38	56.07	7.04
			4.00	13.00	55.00	11.50
13666	8.96	9.13	13.80	12.63	47.07	8.41
			10.85	12.69	49.35	10.00
13667	11.37	6.66	5.51	17.00	56.45	3.01
			3.50	13.50	55.00	5.00
13668	5.47	4.36	4.84	12.56	43.64	29.13
			4.00	11.00	38.00	40.00
13669	9.33	6.91	4.68	15.69	54.47	8.92
			3.75	13.00	55.50	10.00
13670	10.97	1.41	3.62	8.63	74.02	1.35
			3.50	10.00	60.00	8.00
13671	5.78	11.12	12.03	11.19	44.62	15.26
			8.00	10.00	40.00	12.00
13672	10.00	4.64	10.78	11.19	62.74	.65
			9.50	9.45	63.00	1.50
13609	14.64	1.40	2.38	7.00	73.88	.70
13673	6.80	1.33	3.56	8.81	78.32	1.18
13674	11.48	1.38	4.26	8.19	73.18	1.51
13675	10.95	1.36	3.75	8.38	74.48	1.08
13676	7.55	8.60	13.90	12.38	48.66	8.91
			12.29	11.25	41.88	11.30

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
13677	Rice Polish	J. F. Krebs, Moss Point.....
13678	Rice Polish	Hattiesburg Grocery Co., Hattiesburg.....
13679	Rice Polish	Johnson-Hand Co., Ellisville.....
		Guarantee.....
	GREAT WESTERN CEREAL CO., Chicago, Ill.	
14048	Boss Feed	Grenada Grocery Co., Grenada.....
14049	Boss Feed	Southern Commission Co., Greenville.....
14050	Boss Feed	Southern Commission Co., Greenville.....
14051	Boss Feed	Greenwood Grocery Co., Greenwood.....
14052	Boss Feed	W. B. and T. F. Barry, Benoit.....
14053	Boss Feed	W. A. Speaker, Benoit.....
14054	Boss Feed	J. R. Parkinson, Benoit.....
14055	Boss Feed	Compromise Plantation, Benoit.....
14056	Boss Feed	Payne & Jackson, Benoit.....
14057	Boss Feed	J. R. Bond & Co., Beulah.....
		Guarantee.....
14068	Daisy Dairy Feed	Southern Commission Co., Greenville.....
		Guarantee.....
13839	Excelsior Stock Feed	Mellon Bros., Bolton.....
14072	Excelsior Stock Feed	H. A. Moore, West.....
14073	Excelsior Stock Feed	R. L. Crook & Co., Vicksburg.....
14074	Excelsior Stock Feed	J. S. Allred, Hazlehurst.....
		Guarantee.....
	GOOD LUCK MILLS, St. Louis, Mo.	
13680	Good Luck Feed	The Goyer Co., Greenville.....
		Guarantee.....
	GULFPORT GROCERY COMPANY, Gulfport, Miss.	
13610	Korn Klub Corn Meal	Biloxi Milling Co., Biloxi.....
		(No Guarantee submitted.)
14081	Mile Post	The Rankin Co., Columbia.....
14082	Mile Post	Walker-Durr Co., Pinola.....
		Guarantee.....
13688	Yel. O. Corn Chops	E. W. Troutman, Long Beach.....
		(No Guarantee submitted.)
	H. L. HALLIDAY MILLING CO., Cairo, Ill.	
13689	Wheat Bran	Guy Northrop, Pass Christian.....
13690	Wheat Bran	Taylor-Wills Grocery Co., Jackson.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13677	10.05	4.50	11.56	10.63	61.92	1.34
13678	9.91	4.70	11.37	11.13	61.19	1.70
13679	9.43	4.52	11.61	10.56	62.59	1.29
			10.17	10.53	62.40	1.20
14048	8.45	3.23	4.59	11.19	66.37	6.17
14049	8.56	3.30	5.95	13.38	64.64	4.17
14050	9.31	4.10	5.89	14.75	61.40	4.55
14051	10.54	4.70	5.46	13.63	61.11	4.56
14052	12.40	4.42	5.74	12.81	60.62	4.01
14053	10.66	3.46	6.52	12.06	62.82	4.48
14054	10.64	3.61	6.10	13.19	61.64	4.82
14055	10.45	3.45	5.44	11.81	65.29	3.56
14056	5.61	3.14	4.51	10.25	70.99	5.50
14057	9.77	3.96	6.12	13.25	62.13	4.77
			4.00	9.50	60.00	10.00
14068	5.92	7.50	4.18	18.00	51.26	13.14
			3.50	15.00	50.00	12.00
13839	6.40	4.52	5.07	10.94	68.47	4.60
14072	8.38	4.38	5.24	13.19	63.72	5.09
14073	8.88	3.95	5.67	9.44	66.70	5.36
14074	10.35	4.10	5.94	11.81	63.45	4.35
			4.00	9.50	60.00	10.00
13680	9.48	6.37	5.27	13.19	57.12	8.57
			3.80	10.00	59.20	11.90
13610	16.46	1.10	3.90	7.63	70.01	.90
14081	10.11	3.97	3.50	11.13	63.57	7.72
14082	10.53	4.73	3.83	12.75	62.50	5.66
			3.50	10.00	57.50	12.00
13688	9.65	1.20	3.39	8.19	76.02	1.55
13689	7.59	5.65	5.08	16.81	58.65	6.22
13690	10.20	5.11	4.58	15.94	57.99	6.18
			4.00	14.00	55.00	8.50

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	THE HANNAH DISTRIB. CO., Jackson, Miss.	
13691	Wheat Bran	J. K. Dunn, McComb.....
		Guarantee.....
13692	Corn Chops.....	W. M. Carstarphen, Bolton.....
		(No Guarantee submitted).
13693	Rice Polish	The Hannah Distributing Co., Jackson
		Guarantee.....
13694	Wheat Shorts.....	The Hannah Distributing Co., Jackson
		Guarantee.....
	HARRIS & COMPANY, Meridian, Miss.	
13695	"Tip Top" Prepared Cattle Feed	Harris & Co., Meridian.....
13696	"Tip Top" Prepared Cattle Feed	Columbia Grocery Co., Columbia.....
		Guarantee.....
13697	"Tip Top" Horse Feed.....	Harris & Co., Meridian.....
		Guarantee.....
	HARTFIELD & COOK, Memphis, Tenn.	
13698	Wheat Bran	Farmers Warehouse Co., Ackerman....
		Guarantee.....
13699	"Old Miss." Stock Feed	Ruffin Merc. Co., Ellisville.....
		Guarantee.....
	J. B. HORTON & COMPANY, Memphis, Tenn.	
13700	Rice Meal	R. Watts & Co., Seminary.....
		(No Guarantee submitted.)
	THE HUNTER BROS. MILLING CO., St. Louis, Mo.	
13701	Wheat Middlings	The McHenry Merc. Co., McHenry....
13702	Wheat Middlings	D. W. Wilkinson & Bro., Jackson.....
		Guarantee.....
	HUNTER-ROBINSON WENZ. MILLING COMPANY, St. Louis, Mo.	
13703	Wheat Shorts.....	R. H. Green & Bro., Jackson.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13691	9.92	6.21	4.83 <i>3.50</i>	17.44 <i>12.00</i>	54.52 <i>54.00</i>	7.08 <i>9.00</i>
13692	13.22	1.22	3.24	8.00	71.72	2.60
13693	10.37	4.76	11.22 <i>5.50</i>	11.81 <i>10.00</i>	60.83 <i>50.00</i>	1.01 <i>12.00</i>
13694	10.55	4.81	5.92 <i>3.50</i>	17.69 <i>12.00</i>	57.18 <i>54.00</i>	3.85 <i>8.50</i>
13695	8.51	4.69	4.91	17.69	40.88	23.32
13696	7.45	3.75	3.50 <i>3.50</i>	16.63 <i>12.50</i>	39.88 <i>29.24</i>	28.79 <i>33.81</i>
13697	10.64	4.14	3.90 <i>3.85</i>	12.06 <i>11.00</i>	61.24 <i>55.35</i>	8.02 <i>11.95</i>
13698	9.65	5.92	4.91 <i>3.57</i>	18.38 <i>14.80</i>	54.02 <i>54.60</i>	7.12 <i>10.00</i>
13699	7.70	3.84	4.53 <i>4.00</i>	13.19 <i>13.00</i>	58.45 <i>55.00</i>	12.29 <i>11.50</i>
13700	7.94	10.25	14.30	13.06	42.90	11.55
13701	8.81	4.59	6.10	19.00	57.52	3.98
13702	10.92	5.59	5.70 <i>4.00</i>	18.44 <i>16.00</i>	55.58 <i>56.00</i>	3.77 <i>9.00</i>
13703	10.17	4.08	5.81 <i>4.00</i>	17.25 <i>15.00</i>	59.55 <i>55.00</i>	3.14 <i>6.00</i>

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
ILLINOIS FEED MILLS, St. Louis, Mo.		
13704	Hen Feed	W. A. McDonald, Bay St. Louis.....
13705	Hen Feed	W. A. McDonald, Bay St. Louis.....
		Guarantee.....
13706	Star Feed	McMahon Grocery Co., Greenville.....
13707	Star Feed	Delta Grocery Co., Clarksdale.....
13708	Star Feed	G. A. Wilson, Jr., Greenwood.....
		Guarantee.....
INTERSTATE MILLING COMPANY, Memphis, Tenn.		
13709	Sugaration Stock Feed	The Goyer Co., Greenville.....
13710	Sugaration Stock Feed	J. Niles Boyd, Kosciusko.....
		Guarantee.....
KEMPER MILL & ELEVATOR CO., Kansas City, Mo.		
13711	Wheat Bran	C. M. Elder, New Albany.....
		Guarantee.....
KIMBALL CEREAL COMPANY, Kansas City, Mo.		
13712	Wheat Shorts.....	J. J. Rogers & Sons, Tupelo
		Guarantee.....
KORNFALFA FEED MILLING CO., Kansas City, Mo.		
13716	Kornfalfa Feed	The L. L. Dinson Co., Bay Springs....
13717	Kornfalfa Feed	Anderson Merc. Co., Richton.....
13718	Kornfalfa Feed	Union Naval Stores, Gulfport.....
13719	Kornfalfa Feed	Wiggins Turpentine Co., Bond.....
13720	Kornfalfa Feed	J. S. Adkinson, McHenry.....
13721	Kornfalfa Feed	The Kennedy Co., Wiggins.....
		Guarantee.....
H. T. LAWLER MILLING & TRADING COMPANY, New Orleans, La.		
13722	X X X Shorts	W. A. McDonald, Bay St. Louis.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13704	9.58	2.04	4.01	11.44	70.45	2.84
13705	11.03	2.01	3.63 3.50	11.19 10.00	69.81 60.00	2.33 6.00
13706	8.59	4.58	4.28	12.75	64.07	5.73
13707	8.82	4.81	4.52	12.69	63.00	6.16
13708	8.27	6.17	4.40 3.80	13.13 12.00	61.26 58.00	6.77 8.90
13709	5.52	4.57	4.24	12.06	66.42	7.19
13710	9.70	7.19	4.17 3.60	14.81 11.65	55.00 64.40	9.13 11.40
13711	8.68	6.67	4.75 4.00	16.94 14.50	54.57 53.50	8.39 9.50
13712	10.22	4.04	4.76 3.50	16.38 14.50	60.16 60.00	4.44 3.50
13716	9.00	8.07	4.24	11.75	61.76	5.18
13717	8.28	4.49	3.66	11.00	55.21	17.36
13718	7.51	4.34	3.66	11.63	64.98	7.88
13719	9.68	3.67	2.80	10.75	66.34	6.76
13720	7.39	4.56	3.17	11.31	64.20	9.37
13721	8.87	3.95	3.55 3.50	11.25 11.00	64.98 60.00	7.40 12.00
13722	10.61	4.16	5.57 4.75	16.19 16.50	59.89 55.00	3.58 7.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	LAWRENCE & HAMILTON FEED COMPANY, New Orleans, La.	
13723	Staforlife Feed.....	W. A. McDonald, Bay St. Louis.....
13724	Staforlife Feed.....	W. E. Laird, Hattiesburg.....
13725	Staforlife Feed.....	Biloxi Milling Co., Biloxi.....
13726	Staforlife Feed.....	M. M. Moody, Long Beach.....
13727	Staforlife Feed.....	Gaddis & McLaurin, Bolton.....
13728	Staforlife Feed.....	E. M. Carter, Centreville.....
13729	Staforlife Feed.....	A. Beer & Co., Natchez.....
13730	Staforlife Feed.....	Capital Grocery Co., Jackson.....
	Guarantee.....	
	LEONA RICE MILLING COMPANY, New Orleans, La.	
13731	Rice Bran	W. A. McDonald, Bay St. Louis.....
		Guarantee.....
13732	Rice Polish	W. A. McDonald, Bay St. Louis.....
		Guarantee.....
	LIBERTY MILLS, Nashville, Tenn.	
13733	Wheat Bran	The Goyer Co., Greenville.....
13734	Wheat Bran	Delta Grocery Co., Clarksdale.....
13735	Wheat Bran	Greenwood Grocery Co., Greenwood.....
		Guarantee.....
13736	Wheat Shorts.....	Winner-Klein Co., Meridian.....
13737	Wheat Shorts.....	R. Renigue, Scranton.....
13738	Wheat Shorts.....	DeJean Mitchell Co., Scranton.....
13739	Wheat Shorts.....	The Walter Fisher Co., West Point.....
13740	Wheat Shorts.....	The Goyer Co., Greenville.....
		Guarantee.....
	MEEK MILLING COMPANY, Marissa, Ill.	
13741	Wheat Bran and Ground	
	Wheat Screenings	L. G. & J. T. Montgomery, Yazoo City
13742	Wheat Bran and Ground	
	Wheat Screenings	J. S. Adkinson, McHenry.....
		Guarantee.....
13743	Wheat Shorts.....	J. S. Adkinson, McHenry.....
		Guarantee.....
	MILLSTADT MILLING COMPANY, Millstadt, Ill.	
13744	Wheat Bran	Biloxi Milling Co., Biloxi.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13723	8.06	9.36	5.36	10.38	55.00	11.84
13724	8.69	10.04	6.45	11.63	53.21	9.98
13725	8.21	9.54	6.16	11.88	55.71	8.50
13726	9.98	10.15	6.98	11.81	50.39	10.69
13727	9.01	9.87	6.07	11.63	51.84	11.58
13728	9.54	10.86	5.80	11.13	51.79	10.88
13729	7.77	9.98	5.42	11.38	53.90	11.55
13730	9.81	9.74	6.22	11.31	51.90	11.02
			6.00	11.00	53.00	12.00
13731	9.26	8.74	9.94	11.69	51.52	8.85
			8.87	11.44	53.55	9.37
13732	9.75	5.48	10.99	10.94	61.36	1.48
			4.77	10.13	69.28	2.20
13733	7.41	7.39	4.92	15.88	55.20	9.20
13734	7.87	6.40	4.58	16.88	56.37	7.90
13735	6.19	6.12	4.50	16.81	59.05	7.33
			4.00	14.50	50.00	9.50
13736	8.88	4.60	4.91	18.69	57.81	5.11
13737	10.42	4.45	4.53	16.88	58.64	5.08
13738	10.14	4.18	4.48	16.75	59.69	4.76
13739	10.84	3.84	4.68	17.19	59.35	4.10
13740	8.99	5.60	5.32	18.69	56.33	5.07
			4.00	16.00	48.00	6.00
13741	6.33	6.27	4.74	16.31	58.61	7.74
13742	7.58	6.64	5.12	17.06	55.74	7.86
			3.50	13.50	50.00	12.00
13743	11.14	3.54	4.28	16.00	62.24	2.80
			3.50	13.50	54.00	8.50
13744	8.16	7.50	5.70	16.25	54.24	8.15
			3.50	11.27	59.54	6.04

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
MOHLENBROCK MILLING CO., Campbell Hill, Ill.		
13745	Mohlenbrock's Bran	T. B. Cockrell, Itta Bena..... Guarantee.....
13746	Mohlenbrock's Shorts	T. B. Cockrell, Itta Bena..... Guarantee.....
JOHN F. MYER & SONS MILL. CO., Springfield, Mo.		
13747	Albatross Wheat Bran	Postlethwaite Stewart Co., Natchez.... Guarantee.....
NUTRILINE MILLING COMPANY, Crowley, La.		
14252	Nutriline	Hannah Distributing Co., Jackson.....
14253	Nutriline	W. A. McDonald, Bay St. Louis..... Guarantee.....
PHOENIX FLOUR MILLS, Evansville, Ind.		
13750	Fancy Shorts	H. A. Busick Co., Brandon..... Guarantee.....
GEO. P. PLANT MILLING CO., St. Louis, Mo.		
13751	Wheat Bran	W. A. McDonald, Bay St. Louis.....
13752	Wheat Bran	Geisenberger & Friedler, Natchez.....
13753	Wheat Bran	Rumble & Wensel Co., Natchez..... Guarantee.....
QUAKER OATS COMPANY, Chicago, Ill.		
14130	Banner Feed	Newberger Merc. Co., Coffeeville.....
14131	Banner Feed	Taylor Merc. Co., Como.....
14132	Banner Feed	Phil Pointer, Como.....
14133	Banner Feed	Crawford Grocery Co., Greenville.....
14134	Banner Feed	Crawford Grocery Co., Greenville.....
14135	Banner Feed	Crawford Grocery Co., Greenville.....
14136	Banner Feed	Gaddis & McLaurin, Bolton.....
14137	Banner Feed	W. M. Carstarphen, Bolton.....
14138	Banner Feed	A. J. Lewis, Edwards.....
14139	Banner Feed	W. G. Redfield, Edwards..... Guarantee.....
13762	Schumacher's Scratching Grains	R. Viener & Co., Natchez..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13745	7.46	6.83	5.11 3.50	15.56 11.00	56.99 40.00	8.05 11.00
13746	11.58	3.86	5.50 3.50	17.00 13.00	58.38 40.00	3.68 8.00
13747	8.15	6.07	5.40 3.65	16.81 14.75	56.35 52.00	7.22 10.50
14252	8.85	8.84	8.79	10.94	55.24	7.34
14253	7.18	8.03	10.18 3.50	11.69 12.00	55.28 58.00	7.64 10.00
13750	10.49	4.92	4.92 4.00	17.00 14.50	58.38 55.00	4.29 7.00
13751	10.89	6.08	4.45	18.13	53.53	6.92
13752	9.77	6.61	4.83	17.31	53.34	8.14
13753	10.21	6.68	4.68 4.00	17.25 16.00	52.75 54.00	8.43 9.00
14130	9.08	3.84	4.03	12.13	66.68	4.24
14131	10.83	3.31	4.92	12.75	63.47	4.72
14132	10.38	3.56	4.46	12.13	64.85	4.62
14133	10.21	3.41	4.64	13.94	63.95	3.85
14134	9.98	3.37	4.55	13.00	65.33	3.77
14135	9.83	3.76	3.92	14.44	63.75	4.30
14136	9.45	3.43	3.85	12.63	67.14	3.50
14137	8.91	3.69	4.23	13.06	64.99	5.12
14138	9.85	3.66	4.70	13.06	64.40	4.33
14139	9.54	3.55	4.82 3.75	12.94 9.75	64.42 63.00	4.73 10.50
13762	10.94	1.32	3.74 3.50	10.00 10.50	72.43 64.00	1.57 4.50

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	RALSTON - PURINA COMPANY, St. Louis, Mo.	
13763	Wheat Bran	W. A. McDonald, Bay St. Louis
		Guarantee.....
13764	Poultry Feed	Biloxi Milling Co., Biloxi.....
13765	Poultry Feed (Chick Size)	Clark & Tyler, Holly Springs.....
13766	Poultry Feed (Chick Size)	Merchants Grocery Co., Hattiesburg.....
13767	Poultry Feed (Scratch Size)	Rumble & Wensel Co., Natchez.....
13768	Poultry Feed (Scratch Size)	Merchants Grocery Co., Hattiesburg.....
		Guarantee.....
13769	Protena Feed	Capital Grocery Co., Jackson.....
		Guarantee.....
13770	Purina Feed	Capital Grocery Co., Jackson.....
13771	Purina Feed	Hattiesburg Grocery Co., Hattiesburg.....
13772	Purina Feed	Tom Lyle Grocery Co., Meridian.....
13773	Purina Feed	T. E. Winn, Laurel.....
13774	Purina Feed	Reeves Grocery Co., Tupelo.....
13775	Purina Feed	Robert Herman, Greenwood.....
13776	Purina Feed	The Goyer Co., Greenville.....
13777	Purina Feed	Yazoo Grocery Co., Yazoo City.....
		Guarantee.....
	ROBERTS & HAMNER GRAIN CO., Memphis, Tenn.	
14248	Graino Alfalfa Mixed Feed	J. B. Wardlaw, Como.....
		Guarantee.....
	ST. MARY'S MILL COMPANY, St. Mary's, Mo.	
13780	Wheat Bran	C. C. Fancher, McCool.....
		Guarantee.....
13781	Wheat Middlings	C. C. Fancher, McCool.....
		Guarantee.....
	SCOTT COUNTY MILLING CO., Sikeston, Mo.	
13782	Wheat Bran	J. J. Rogers & Sons, Tupelo
		Guarantee.....
13783	Corn Chops.....	D. W. Wilkinson & Bro., Jackson.....
13784	Corn Chops.....	Hannah Distributing Co., Jackson.....
		(No Guarantee submitted).
	STEELEVILLE MILLING CO., Steeleville, Ill.	
13785	Steeleville Bran	W. B. Potts & Sons, Kosciusko.....
		Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
13763	9.06	5.37	4.26 4.00	14.31 14.00	57.96 56.00	9.04 9.00
13764	11.73	1.77	4.07	10.44	69.89	2.10
13765	9.83	1.99	3.83	10.63	71.42	2.30
13766	10.22	2.32	4.25	10.69	70.37	2.15
13767	10.83	1.84	4.40	10.94	70.14	1.85
13768	8.17	1.73	3.81 3.60	10.88 11.00	72.97 65.00	2.44 4.00
13769	9.45	5.38	4.48 3.80	12.13 12.00	62.78 58.00	5.78 8.90
13770	8.63	4.83	4.46	12.00	64.38	5.70
13771	8.99	4.88	4.26	12.69	64.18	5.00
13772	7.80	5.54	5.12	12.94	62.99	5.61
13773	8.65	5.00	4.50	12.88	62.90	6.07
13774	7.71	3.68	4.16	12.00	67.35	5.10
13775	8.00	5.03	4.96	12.63	63.65	5.73
13776	8.49	5.25	5.89	12.94	62.48	4.95
13777	7.96	5.08	5.52 4.00	12.94 12.50	61.30 58.00	7.20 8.90
14248	7.95	4.20	3.69 4.00	11.44 12.00	68.03 54.00	4.69 10.00
13780	7.88	5.73	5.17 3.56	16.88 15.06	57.68 54.70	6.66 8.93
13781	10.65	3.22	4.87 4.20	16.31 15.81	62.82 62.37	2.13 2.90
13782	7.73	5.30	5.20 4.00	16.88 14.15	59.20 55.00	5.69 9.00
13783	8.88	1.52	4.30	8.88	75.42	1.00
13784	8.56	1.42	4.48	8.69	75.75	1.10
13785	7.33	2.32	5.13 3.50	15.88 14.50	63.01 50.00	6.33 10.00

TABLE I.—Analyses of Commercial Feeding Stuffs

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	TENNESSEE FIBRE COMPANY, Memphis, Tenn.	
14179	Creamo Brand Feed Meal (Cow and Ox)	Banks & Co., Hernando.....
14180	Creamo Brand Feed Meal (Cow and Ox)	Broadway Merc. Co., Lucedale..... Guarantee.....
	VALLEY MILLING COMPANY, St. Louis, Mo.	
13894	Delta Feed	I. Lowenberg & Co., Natchez..... Guarantee.....
	JOHN WADE & SONS, Memphis, Tenn.	
13788	Wheat Bran	G. Lowenberg, Kosciusko..... Guarantee.....
13789	Alfalfa Mixed Feed	J. L. Melton, Greenwood.....
13790	Alfalfa Mixed Feed	Stern's Bros. Co., Greenwood..... Guarantee.....
13791	Purity Feed	Stern's Bros. Co., Greenwood.....
13792	Purity Feed	J. F. Melton, Greenwood..... Guarantee.....
	WASHBURN - CROSBY COMPANY, Minneapolis, Minn.	
13793	Coarse Bran	Greenwood Grocery Co., Greenwood.... Guarantee.....
13794	Standard Middlings.....	Clark Grocery Co., Tupelo..... Guarantee.....
	WEBB & MAURY, Memphis, Tenn.	
13795	Wheat Bran	C. W. McKnight, Iuka..... Guarantee.....
13796	Corn Chops.....	Hattiesburg Grocery Co., Hattiesburg (No Guarantee submitted.) ㉔
13797	Wheat Shorts.....	C. W. McKnight, Iuka..... Guarantee.....
	WEST TENNESSEE GRAIN CO., Memphis, Tenn.	
13798	Wheat Middlings	Tom Lyle Grocery Co., Meridian Guarantee.....
	YATES & DONELSON COMPANY, Memphis, Tenn.	
13799	Wheat Bran	Myer Bros., Meridian.....
13800	Wheat Bran	The Miss. Grocery Co., Canton.....
13801	Wheat Bran	R. H. Green & Bro., Jackson..... Guarantee.....

Collected by State Chemist, Season 1909-1910.

Laboratory Number.	Moisture—Per Cent.	Ash—Per Cent.	Crude Fat—Per Cent.	Crude Protein—Per Cent.	Carbohydrates—Per Cent.	Crude Fiber—Per Cent.
14179	8.55	5.26	5.40	24.06	38.98	17.75
14180	8.46	4.97	5.74 5.00	23.63 20.00	38.75 36.00	18.45 25.00
13894	6.84	5.05	4.29 4.25	9.13 9.25	66.84 50.00	7.85 12.00
13788	6.33	6.49	3.90 3.50	15.00 10.00	59.44 50.00	8.84 12.00
13789	7.62	3.82	3.74	11.81	66.19	6.82
13790	7.91	4.12	3.45 3.50	12.06 10.50	64.89 52.00	7.57 12.00
13791	10.06	1.39	4.41	9.00	70.89	4.25
13792	9.45	2.65	4.52 4.25	9.19 9.25	70.25 65.00	3.94 5.50
13793	5.75	6.70	5.48 4.00	15.56 14.50	56.23 50.00	10.28 11.00
13794	8.76	4.20	5.69 4.00	18.31 15.00	57.41 55.00	5.63 8.00
13795	5.55	6.64	4.83 3.50	17.81 10.00	57.29 50.00	7.88 12.00
13796	7.29	1.03	2.67	8.44	79.88	.69
13797	10.50	3.70	4.84 3.50	17.50 10.00	59.93 50.00	3.53 12.00
13798	9.15	4.39	5.80 5.00	19.00 16.00	55.78 40.00	5.88 9.00
13799	4.83	5.74	4.76	17.50	60.60	6.57
13800	5.90	6.20	5.28	17.69	57.83	7.10
13801	6.36	6.38	4.83 3.58	17.44 14.85	57.69 54.60	7.30 10.00

Mississippi Agricultural Experiment Station
Agricultural College, Mississippi.

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BULLETIN No. 146.

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SUGGESTIONS FOR
GROWING HOME FRUITS

BY A. B. McKAY.



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AGRICULTURAL COLLEGE, MISSISSIPPI.

MARCH, 1911.

# STATION STAFF.



|                         |                                          |
|-------------------------|------------------------------------------|
| J. C. HARDY.....        | President                                |
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| E. R. LLOYD.....        | Vice-Director and Animal Husbandman      |
| W. F. HAND.....         | Chemist                                  |
| W. N. LOGAN.....        | Geologist                                |
| J. S. MOORE.....        | Dairy Husbandman                         |
| G. L. CLOTHIER.....     | Botanist                                 |
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| MISS SIDNEY GAY.....    | Stenographer                             |
| E. B. FERRIS.....       | Assistant Director McNeill Station       |
| C. T. AMES.....         | Assistant Director Holly Springs Station |
| G. B. WALKER.....       | Assistant Director Delta Station         |

# SUGGESTIONS FOR GROWING HOME FRUITS

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**Time to plant.**—While fruit trees and grapes may be planted at any time during the dormant or inactive period from November to March, it is best to set them as early as possible after the advent of cool, frosty weather. When they are set at this time, the soil settles down nicely about the plants with the first rains; the cut surfaces at the ends of the roots soon heal over and, before midwinter, quite a system of newlyformed roots will have developed, thus insuring greater immunity from adverse conditions during the following spring and summer than is possible with later plantings. Midwinter plantings should be made only during mild weather and when the soil is in good working condition. When planting is deferred until March greater care must be given to the preparation of the soil and to the work of setting. If dry weather prevails water should be applied freely to each tree or vine while it is setting to settle the soil properly about the roots. If dry weather continues newly set trees and vines may require water several times before growth is established. After each application of water the soil about the plants should be stirred to prevent crusting and too rapid evaporation. A covering of half-rotted leaves or straw placed within a radius of three feet around the tree will conserve moisture and keep the soil mellow and cool. Following this plan the writer has had success with trees received for trial and planted late in March.

Some years ago, during the Christmas holidays, a large peach orchard was being planted in northeast Mississippi. Bad weather stopped the work and several thousand trees were left lined out in trenches with soil nicely banked about the roots for more than two and a half months, there being no opportunity to return and finish the orchard until March 20th. By this date many of the leaves had grown to nearly or quite half size. The soil was in ideal planting condition, and March 24th found the trees carefully planted and each tree headed or cut back to a single stem only about eight or ten inches high. These trees were approximately four feet high (an excellent size for transplanting) and well rooted when received from the nursery the previous December. With no facilities for watering, chances had to be taken on the weather. Fortunately, a soaking rain came immediately after planting was finished and, during the following six



weeks, cool, showery weather prevailed. The trees grew off promptly. The end of the first growing season found less than one per cent of the trees missing, and the March planting only a trifle behind that made in December. The above incident on late planting is given for the benefit of those who may fail to plant at the proper season.

**Location and preparation of soil.**—Fruit trees need air drainage as well as soil drainage, hence high or rolling land is best. On steep hillsides northern or western slopes are considered safer from the ill effects of frost and severely cold weather than eastern or southern exposures. Because of the drier lighter atmosphere and the freer circulation of air on the hill tops, such locations favor most the development of healthy trees and perfect fruit.

While with good attention most of our fruits will adapt themselves more or less to adverse soil or climatic conditions, yet each fruit will yield the best results only when its peculiar requirements are provided. Peaches, plums, and grapes prefer moderately fertile, dry soil more inclined to clay than to sand. Apples, pears, quinces, and figs need deeper, richer loams. With all of these fruits, porous clay subsoils that will permit the roots to penetrate to a good depth are better than sand beds. If possible to do so, avoid hard, compact subsoils no matter what the character of the surface soil.

As the orchard and vineyard are to occupy the land for several years the work of thoroughly preparing the soil before planting is important. Whether planting is to be done early or late in the season, there is no time during the whole year so opportune for effective work with plow, subsoil plow, and harrow as just after the first good fall rains. At this time the subsoil is moist, not wet, and lasting benefits result from stirring and pulverizing the subsoil to a good depth when it is in just the right condition. Midwinter and early spring may find clay subsoils saturated, even when the surface soil is in fair condition for plowing. With the soil in such condition more harm than good results from subsoiling. When it becomes necessary to plant where the subsoil is naturally hard and compact, holes at least thirty inches square and eighteen inches deep should be made for the reception of trees and grape vines. Each hole should be nearly filled with good top earth. Where convenient it is well to use at least two bushels of black mould from the woods with each tree and vine. If this is not to be had, a bushel of well rotted barnyard manure is a good substitute. Where neither of these is at hand equal parts by weight of high grade phosphate and cottonseed meal, two pounds to the tree or vine, will answer. Mix such materials well with the soil from

bottom to top of the hole. No heating or fermenting fertilizers should come directly in contact with the roots of newlyplanted trees. With plenty of rich top earth to use about the tree the fertilizing materials just mentioned are not necessary.

### ORCHARD.

**Selection of trees and planting.**—Too often the mistake is made of ordering three to four year old trees, heavily branched, which come with only a few large stubby roots, nineteen-twentieths of the root system having been left in the soil of the nursery row, when younger, better trees lifted from the nursery rows with nearly all their roots attached may be had at a lower price. These younger, better rooted trees with few, if any, branches, grow off more promptly than the older specimens and develop sooner into vigorous, healthy trees ready to produce maximum crops of fruit. Not long since, the writer received an order for three-year-old strawberry plants. Recently an order came which read as follows: "Please ship at once 1,000 of your oldest strawberry plants. I am anxious to get plants that will give me fruit at the earliest time possible." He was sent, not what he ordered, but what he really needed, the youngest and best plants in stock.

Peach and plum trees three to five feet high with smooth, straight trunks and few side branches are best. Only one-year trees should be used. Strong one-year grape vines grow off better and fruit as soon as older plants. If well grown one-year apple and pear trees cannot be had, plant select two-year trees.

Have no dealings whatever with the unscrupulous, oily-tongued tree peddler, who is abroad in the land deceiving the uninformed with pretty pictures and greatly exaggerated specimens of fruit; who is selling at high prices trees, vines, and other plants infested with disease and injurious insects and not true to name. The honest agent who is satisfied with fair profits and whose credentials show clearly that he represents reputable nurseries is to be encouraged. He is helping to disseminate good trees and to encourage the planting and proper care of orchards, vineyards, and ornamental plants, where, without such aid, hundreds of homes would never see a nursery catalogue, read a fruit magazine, nor plant an orchard. Where possible to do so, deal directly with the nearest nursery firm that can furnish the goods desired. Plants should come cheaper from the nursery proprietor than through agents and, should any mistakes occur, he is easier to reach than the middle man. The State Inspector's certificate, stating that the nursery is apparently free from seriously

injurious insect pests and plant diseases, should accompany each shipment of plants. Nursery catalogues indicate fairly well the comparative merits and the ripening period of each variety in their respective lists. These catalogues may be had free of cost. Appended to this bulletin is a list of nurserymen located in Mississippi. Excellent trees and grape vines should be had at about the following prices: peach and grapes, 10c to 20c each, \$1.00 to \$2.00 per dozen; apple, plum, and fig, 15c to 20c each, \$1.50 to \$2.00 per dozen; pear and quince, 20c to 30c each, \$2.00 to \$3.00 per dozen. Rates by the hundred are cheaper than by the dozen, and wholesale rates are perhaps less than the above prices.

The commercial grower seldom plants more than three or four varieties of the same fruit, and sometimes confines himself to but one. The home orchard, however, should include such a list as will give a continuous supply of each fruit represented from the earliest to the latest ripening. Variety for variety's sake is of little value. Of ten varieties of peaches ripening at the same time, choose the best one, or not more than two kinds, and discard the rest; and so with other fruits.

While the following is by no means an exhaustive list of good varieties, it includes such as, upon repeated tests, have been found worthy of place in Mississippi orchards, vineyards, and strawberry plantings. Names are given in approximate order of ripening.

**Apple.**—Red June, Astrachan, Transparent, Carolina Watson, Day, Horse, Bonum, Carolina Greening, Roxbury Russett, Commerce, Champion, Black Ben Davis, Winter Queen, Stevenson's Winter.

**Peach.**—Alexander\*, Greensboro\*, Mamie Ross, Carmen, Belle of Georgia, O. M. Free, Thurber, Family Favorite, Hiley, Gen. Lee†, Elberta, Globe, Crawford's Late, Stonewall Jackson†, Emma, Columbia, Picquet's Late, Indian Blood†, Pineapple or Lemon†.

**Plum.**—Wild Goose, Milton, Abundance, Red June, Burbank, Ogon, Doris, Apple.

**Pear.**—Koonce, Garber, Duchesse d' Angoulem, Kieffer, Seckle.

**Quince.**—Angiers, Apple, Chinese, Rea's.

**Fig.**—Brown Turkey, Celestial, Green Ischia.

**Grape.**—Moore's Early, Perkins, Delaware, Diamond, Concord, Niagara, Goethe.

**Strawberry.**—Excelsior, Lady Thompson, Klondike, Aroma, Gandy

\* Semi-cling stone, or flesh partly adhering to seed.

† Cling stone, or flesh adhering to seed.



If planting cannot be done immediately upon arrival of trees dig a trench in some well drained place, stand the trees in the trench and bank well pulverized soil about the roots, covering deeper than they stood in the nursery. If goods are frozen upon arrival, place in cellar or some other cool, dark apartment and let remain without unpacking until the entire package is thawed out.

When ready to plant inspect each tree carefully and remove any insects that may be found on or beneath the bark of roots or stem. With a sharp knife or pruning shears trim off all bruised parts, leaving a smoothly cut surface at the end of each root. In setting the tree or vine hold the plant in an upright position and, with the hand, work in among the roots well pulverized soil. When the roots are all covered pack the soil over them by tramping firmly with the feet. Finish filling the hole with loose earth, leaving the plant set a little deeper than it stood in the nursery row.

**Distance of planting.**—The distance between trees should be governed by the character of the soil, the kind of fruit, and the method of training or pruning. On rather thin soil peaches and plums may be set fifteen to seventeen feet apart each way. On richer soils eighteen to twenty-four feet may be required. For the same reason give pears eighteen to twenty-five feet and apples twenty to thirty feet. In home plantings where all of these fruits are to be grown in the same orchard, settle on one width between all trees. Commercial fruit-growers sometimes plant apple and peach trees in the same orchard, using peach trees as a "filler." The apple trees are set thirty to thirty-two feet apart each way. A row of peach trees is planted between each two apple rows, the peach trees being just half as far apart in the row as the apples. The planting is finished by setting a peach tree half way between each two trees in the apple rows. Thus we have the trees equally spaced, an apple tree at the center of a square and a peach tree at each corner—three peach trees to each apple tree in the orchard. In the home orchard this same plan might be used to advantage, giving apples and pears the wider distance and using peach and plum trees as fillers. The latter being shorter lived would, in most instances, pass their period of usefulness before the entire space would be needed by the former, and could be easily removed. Quince and fig trees seldom find place in the orchard plat. They are usually regarded as pet trees to be set in some favored places about the door yard. Soil can scarcely be made too rich for fig trees. They thrive best in sheltered places where the trees get the benefit of drainage



from the garden, poultry house, or barnyard. In such locations they are wonderfully productive.

**Pruning trees and thinning fruit.**—With peaches and plums low, spreading, open-headed trees are desirable. When planting cut each tree back to a single stem about ten or fifteen inches high, taking care to leave just below the point where the top is severed three or four plump healthy buds. From these buds will grow the branches which are to form the frame work of the future tree. In the spring, when several branches on this stem have grown to the length of ten or twelve inches, select two to four of the best, each pointing in a different direction, and remove all the rest. Keep the stem free from any other branches that may start after this time. The tendency of peach and plum trees, especially in strong soil, is to make too much wood growth. Remember, in this connection, that the peaches and plums of this season are found only on the wood of last season's growth. To preserve this low, spreading open head and to distribute the fruit bearing wood evenly throughout the entire tree it may be necessary to cut back each season's growth one-third to one-half of its length. On thin land little if any shortening may be necessary, but quite a percentage of small branches entirely removed will admit more light and better circulation of air among the remaining branches, thus strengthening the tree and improving the quality of the fruit. Shortening the branches while small multiplies the number of fruit-bearing twigs throughout the entire head, and keeps the tree constantly renewing itself near the ground rather than at the extremity of a few long, tall branches.

Properly pruned trees, trained from the start, will hold, without breaking a branch, four times as much fruit as the tree should bring to maturity. On such trees, even when in bearing for several years, all the fruit should be gathered without the aid of a step ladder. Neglect this shortening-in process with trees on strong land and the fruit (always on young wood) will soon be found beyond reach and at the extremities of long, tall branches where only a little weight is necessary to break the tree to pieces.

Apple and pear trees may be started somewhat higher than peach trees. One-year trees should be cut to a single stem. With two-year, or older trees, more or less branched, all but four or five branches should be cut away and these shortened to five or six inches, leaving one near the center longer than the rest to serve as leader. As the tree develops, so prune as to keep each limb with its smaller branches apart from the rest to admit plenty of air and sunshine. Follow

the same method with quince and fig. During the first two or three years considerable pruning may be necessary to balance the head and to direct growth properly, but no large branches need be cut at any time. To let orchard trees grow at random until tall and densely branched, and then attempt to remedy the evil by sawing away large limbs and cutting branches back to mere stubs is barbarous, and nothing short of butchery. Less pruning is necessary after trees are in bearing. "Prune when you have a sharp knife," and always have a sharp knife when in the orchard. During the growing season it is best to remove water sprouts and unnecessary branches while they are young and tender, and to pinch out the terminal bud on branches that are growing too tall or reaching too far to one side. Such work is easily done and one scarcely misses the time required. The heavier pruning should be done just after the leaves drop in the fall or shortly before growth begins in the spring. Pruning may be done during mild winter weather.

Peach, plum, and fig trees often produce some fruit the second summer after planting. The third summer they should yield a fair crop. Apple, pear, and quince usually require three to five years to reach the bearing age. Excessive bearing exhausts trees.

Reduce the number of peaches on an overloaded tree and it will usually yield as much fruit by weight or measure as if no peaches had been removed; the same is true to a greater or less extent with other fruits. No tree should be permitted to grow more fruit than it is able to develop properly and without injury to the tree. Figs rarely if ever require thinning. Apple, pear, and quince trees seldom require the removal of much fruit. It is better sometimes to pull off one-third to one-half of the fruit from peach and plum trees. The proper time for thinning peaches is when the fruit is about the size of a peach seed. By this time, defects in size, shape, etc., are easily detected. Plums may be thinned when half the size advised for peaches; apples, pears, and quinces, when something like one inch in diameter. So thin as to leave the fruit well distributed throughout the entire tree. With peaches and plums, it is better that no two fruits touch each other.

**Cultivation and cropping.**—Fruit trees respond as definitely to cultivation as do garden and farm crops, and while young, they should be cultivated with as much care as any other crop. During the first two years, or until the trees require the entire space, such crops as potatoes, melons, strawberries, and cotton may be grown in the orchard,

provided the soil is sufficiently rich to produce good yields without detriment to the trees; otherwise only such restorative crops as peanuts and cowpeas should be grown.

Enriching the soil for crops between the trees and cultivating them also enriches and cultivates the orchard. During the first season nothing should be planted within three and one-half feet of the trees. The second year more room should be given. As the roots and branches of the trees approach the middle space between the rows, shallow cultivation should be practiced as often as necessary to keep the soil free from weeds and in good mellow condition. This should be kept up until June, and then cowpeas should be planted broadcast. Not much vine growth under vigorous trees will be expected but, in the open spaces, where the trees get plenty of sunshine they should cover the soil with a dense growth. With young orchards, it is good practice to sow early in the fall to oats or rye and vetch, using seed liberally. The following spring, before the grain begins to head, plow under, giving the entire crop back to the soil.

When orchard trees are in bearing and well established, cultivations should be shallow and less frequent. Bearing pear trees are less subject to blight when left in unbroken soil. In some cases it is better not to cultivate the soil in bearing apple orchards. For a more detailed treatment of the apple orchard, the reader is referred to Bulletin No. 147.

So feed the orchard as to maintain a healthy tree growth and to supply needs for a bountiful yield of fruit. The quantity of plant food to be added will depend, of course, on the fertility of the soil. It is an excellent plan, when the trees are in bearing to apply broadcast each season, preferably during February, from ten to fifteen two-horse wagon loads of good barnyard manure per acre, or its equivalent in commercial fertilizers. Applied at the time suggested, it matters little whether the fertilizer is left on the surface or cultivated into the soil. Water from subsequent rains sinking into the soil will carry the plant food down to the tree roots.

With proper attention paid to selection of trees and soil, planting, pruning, thinning fruit, cultivating, fertilizing, and combatting insect pests and plant diseases, peach and plum trees should produce profitable crops until ten to fifteen years old; apple, pear, quince, and fig trees should give profitable returns much longer. The writer has gathered fair crops from peach trees twenty years old.



### VINEYARD.

Reference has been made above to the time for planting, to the best soils, locations and exposures for vineyards, to the manner of preparing the soil and setting vines, to purchasing plants, their cost, and a list of good varieties suited to our soils and climate.

As the vines grow rapidly and soon require practically all of the space between plants it is usually best to set grapes in a plat to themselves. The proper distance between rows and between plants in the row is determined by the character of the soil and the comparative vigor of the varieties planted. Ample room should be given for the proper development of vines without crowding. For general planting on good soil the rows should be not less than nine feet apart. Eight feet between plants in the row will be about right for such varieties as Gold Coin and Delaware. Stronger growing varieties like Niagara and Concord do better ten to twelve feet apart. The scuppernongs and similar kinds require from twelve to sixteen feet each way between plants.

While the crops suggested for the orchard may be planted in the vineyard the first season, it is better, perhaps, to limit cropping, from the start, to cowpeas, vetch and oats or rye, and to dispose of these crops as advised for the orchard. Cultivation is of the simplest kind. On sandy or loamy soils where the water sinks away reasonably early after a heavy rainfall the five or the seven-toothed cultivator and the harrow are the only horse implements required. On heavy clays, especially where there is waxy or hardpan soil beneath, it is well to use the one-horse turnplow at the last working each fall to ridge the soil slightly to the rows and to leave a drain furrow between ridges for the escape of surface water, during the winter months when the heaviest rains prevail. Cultivate as often as necessary to keep the soil in good condition and free from weeds. After vines are well established cultivation should be shallow to prevent injury to the roots. Where the horse implements fail to stir the soil along the line of the row and immediately around the plants hand implements should be used.

A single stake to each vine is sometimes the only support given the first season. It is better, however, to provide permanent trellises shortly after planting is done. Of the various patterns used the vertical and the horizontal trellises are the simplest in construction and the most efficient. For these the very best posts available and galvanized wire should be used. The No. 12 wire will do for the less vigorous varieties of grapes. Use heavier wire for the stronger, more



vigorous kinds. The vertical trellis is simply a three-wired fence with the bottom, middle, and top wires placed respectively about 24, 42, and 60 inches above the ground. At each end of the rows the first two posts should be placed seven or eight feet apart and strongly braced, the one to the other, to prevent the tightly stretched wire from sagging. Other posts along the line of the row should be placed midway between plants so that two plants will stand between each two posts. In stretching the wires care should be taken to secure them well to the two braced posts at each end of the rows. It only remains then to space them properly and to staple them to the intermediate posts.

In making the horizontal trellis, posts, set as in the vertical trellis are sawed off squarely five and one-half feet above ground. A 2x4 inch strip two feet long (some prefer three feet) is placed on the top of each post at right angles to the line of the row and securely nailed. The two-foot strips should carry three wires, the middle wire resting directly over the posts, the other two on either side over the ends of the strips. Where three-foot strips are used four wires should rest on the strips, one over each end, the other two dividing the distance so as to give approximately one foot between wires. Where plants are more than eight feet apart place posts so they will not be more than eighteen feet apart in the row. Sixteen feet between posts was the distance suggested above, but this referred to rows in which the plants stood eight feet apart. Growers who have used both trellises usually prefer the horizontal style. With this trellis it is easier to get around the vines, the foliage has a better chance to spread out to the sun, the fruit is better protected from sun and dew and can be more easily gathered than from the vertical trellis. With scuppernongs the overhead or horizontal trellis is frequently made by setting posts twelve to fifteen feet apart each way, using heavy wire instead of 2x4 strips to support the smaller wires, these smaller wires being placed near enough together to support a solid canopy of vines over the entire scuppernong area. It should be said here that no vineyard, in fact no fruit planting for the home in the Gulf states, is complete without a few scuppernong vines. This grape is almost entirely free from insect pests and plant diseases, seldom fails to fruit, and requires little pruning and little cultivation after the vines are in bearing; the fruit is above the average for eating, comes late in the season when other fruits are scarce, and one planting will last almost a life time.

Nothing connected with grape growing is more important than the work of pruning and training. Remembering that the fruit of

this season is formed on the young tender shoots which grew this season from the matured canes of last year's growth, that the tendency of most grapes is to produce too much vine and to extend the branches to a great length, that the desired object should be to keep the plant within its allotted space and to secure in this space the greatest amount of vigorous fruit-bearing wood; with these points in view we should so prune as to get the desired results. After planting the vines cut each one back to two or three buds. When shoots start from these in the spring select the strongest one and tie it to a temporary stake. Remove the other shoots and keep all laterals pinched from the remaining vine as they appear. If the vertical trellis is used the vine may be permitted to branch from the point where it touches the bottom wire. These branches may be directed in a fan shape toward the second and top wires, or a shoot may be trained to the right, another to the left along the bottom wire, and a third shoot in a perpendicular direction toward the second wire. With vigorous vines one shoot may be sent in each direction along the middle wire and a third shoot started toward the top wire to repeat the work accomplished on the wires below. When these side shoots have grown until they nearly meet those from the neighboring vines the ends or growing points should be pinched out. This will cause a thickening of the vines and encourage the development of strong, vigorous laterals. Shortly after growth ceases in the fall, or before the buds show any signs of swelling in the spring, it may be necessary to cut away from half to three-fourths of the previous season's growth, to give the vine and the fruit of the coming season a proper setting. One seldom prunes grapes too severely. Thumb pruning, pinching out unnecessary shoots, shortening back rapid growth, and thinning fruit during the early spring and summer should be practiced. Not much time is required for such work.

If the horizontal trellis is used a single stake to each vine will support it until it reaches the middle wire, where it should be topped and made to fork, the two shoots running in opposite directions from the point of contact with the wire. When of sufficient length top these shoots so the energy of the plant will be spent in developing strong canes for the next year's fruitage.

### STRAWBERRY CULTURE.

In the list of fruits adapted to Mississippi the strawberry stands uniquely alone in three particulars: (1) It is the first fruit of the season; (2) It requires less time than any other from the date of planting to that of the first ripe fruit; (3) A total failure seldom occurs.

With good treatment the strawberry will adapt itself to and produce a fairly good yield on almost any soil that will grow good garden and farm crops. Like other fruits, however, it shows decided preferences. It succeeds better on rather compact soil that will absorb and retain large amounts of moisture than on ashy, loose soils of a thirsty nature. For inexperienced growers a soil of medium fertility is safer, and, in many respects better, than one over rich. Many who plant only for home use make the serious mistake of selecting the richest part of the garden and of adding thereto quantities of barnyard manure or other strongly nitrogenous fertilizers. Such soils require constant work to keep down weeds and grass, and encourage the growth of large sappy plants which produce but little fruit. Such overgrown tender plants cannot survive our long and, sometimes, dry summers.

Planting season may begin with the first good fall rains and continue until March 15th, or so long as the soil remains cool and moist. While successful plantings are sometimes made during midwinter there is danger on clay soils of the plants being lifted out of the ground by repeated freezing and thawing. It is better to plant before the severe winter freezes or as soon as possible after winter weather is past. Successful plantings are sometimes made during midsummer by taking advantage of a rainy spell of weather and shifting plants, with soil adhering to the roots, to nicely prepared soil near by. In the Gulf region planting is frequently done during the late summer and early fall. Plants set at any time, when the weather is favorable, from July to December should produce a fair crop of fruit the following spring. In the Gulf region one or, at most, two crops are gathered from the same setting. Throughout the central and northern parts of the state from two to four crops are gathered from the same planting.

Before planting the soil should be thoroughly broken and pulverized to a good depth. The rows should be slightly elevated. If the hill method of growing is adopted, as is the custom in South Mississippi, three feet between rows is about right; if the matted row is used, three and one-half to four feet between rows is better. With summer and fall plantings, which are expected to bear fruit the following spring, plants should be set not more than twelve inches apart in the row. Varieties like Excelsior, Lady Thompson, and Klondike, which make many runners (new plants), need not be set closer than thirty inches apart in making spring plantings. Stooling kinds like



Nick Ohmer and Gandy should stand eighteen to twenty-four inches apart in the row.

At no time between the taking up and the resetting of plants should the roots be exposed to sunshine or wind. If dry weather prevails, muddy or "puddle" the roots and keep them covered with some moist material until they are committed to the soil. If the roots are long cut them back to about four inches in length. Setters should follow immediately behind the droppers. Care should be taken to spread out the roots of each plant in their natural position and to work finely pulverized soil in among them with the hand. The soil should be firmly pressed over the roots. In no case should the crowns, or center buds, rest below the surface of the ground. On waxy clay soils it is safer to plant a little shallow than too deep. If dry weather prevails pour a pint or more of water around each plant and cover the watered surface with dry soil to prevent crusting. During hot windy weather a handful of short straw, half rotted leaves or like material, left over each plant for a few days after setting will conserve moisture until plant growth is resumed.

Cultivation required for strawberries does not differ materially from that given the average garden vegetable or the nicely treated corn or cotton crop. Differences in latitude, soils, season, etc., render it necessary to vary general rules to suit existing conditions. The object of the first season's treatment is to develop a perfect stand of strong, vigorous plants for the following year's fruit crop. The cultivation of strawberry plants set in the spring should be begun a few weeks after planting. The same cultivator, sweep, and harrow used with garden crops will do the work required between the rows nicely. A four to six tined potato fork and light sharp hoe are the only tools needed to keep the soil along the line of the rows in proper condition. As the vines attain only a few inches in height more care must be taken in cultivating near the rows than with taller plants. It is safe to say that the cultivation of strawberries during the entire year need not cost as much as the same area in garden vegetables. As a rule horse implements may be laid aside about November 1st, and cultivation discontinued until the end of the fruit harvest the following spring. Any grass or weeds that interfere with the plants during the winter or spring months may be cut away with sharp hoes or weeded out by hand. Resume cultivation as soon as possible after the fruit harvest. Begin the work by "barring off" the rows with a sharp one-horse turnplow reducing the matted row to a strip of plants not wider than six to eight inches. In the



bottom of the turnplow furrow run a subsoiler stirring the soil as deep as the strength of your best mule will permit. Follow the subsoil plow with a spike-toothed harrow, well weighted, to level and pulverize the soil in the space between the rows. Sharp hoes should follow, cleaning weeds and grass from the drill and reducing plants to a stand. From this time forward to the end of the season cultivation is the same as for the first year.

On new plantings runners make their appearance early in the spring. If the soil is in nice condition the newly formed plants on these straw-like appendages will root rapidly when brought in contact with the surface. The ideal stand for the matted row is one in which plants are so distributed over a fifteen to eighteen inch strip along the top of the row that each plant will be six to eight inches from its nearest neighbor. The first and best runners should be so placed as to secure the desired stand. Any surplus plants should be treated as so many weeds. The usual method of getting rid of any runners that extend beyond the suggested limits of the matted row is to destroy them with the cultivator. Any surplus plants that may have rooted within the limits of the matted row may be dug out during the fall and early winter and sold or used for making new plantings.

Where fertilizers respond nicely to garden and field crops we may expect good results from the same fertilizers applied to strawberries. A light dressing of barnyard manure applied to the surface along the top of the row during early winter is an ideal fertilizer. In the absence of such manure equal parts by weight of cottonseed meal and high grade acid phosphate, applied at the rate of 500 to 1,000 pounds per acre will usually supply the needed plant food. On sandy soils, especially in southern Mississippi, 100 to 200 pounds of kainit per acre may be added. When using commercial fertilizer in the quantity suggested it is best to make two or three applications during the year; the first during spring, with young plantings, or at the first working after harvest with older beds; the second the latter part of summer, and the third during December. The first two may be applied along each side of the row and lightly cultivated into the soil; the third as a top dressing between and immediately around the plants.

No matter how large or how fine, nothing so injures the looks, taste, and sale of strawberries as sand or soil adhering to the fruit; hence, the good reason for carefully mulching the entire planting where pine needles, oat or wheat straw, old hay, half rotted leaves, and such materials may be had at small cost. Mulching materials should be placed between and along each side of the plants and under

the foliage but never directly over the plants. It should be sufficiently thick to hide the soil from view. Mulching should be done after cold weather has killed or driven into winter quarters most of the insects.

Picking season begins about one month from the date of the last killing frost. Near the Gulf berries frequently begin to ripen during the latter part of February. In the middle and northern sections of the state harvest begins April 1st to 15th. Gathering period may last from four to twelve weeks; and, as a rule, is of longer duration near the Gulf than farther north. To make the vines yield their best, all faulty fruit should be kept off and the good berries gathered as soon as sufficiently matured for market or for table use.

The greater the care in gathering and in handling the fruit, the longer it will keep in good condition. In picking slip the thumb and first finger below each berry and pinch off with it about one inch of stem. Handle the fruit as little as possible and keep in a cool place until ready for shipment or for home use.

Remember that strawberries and the other fruits mentioned in this bulletin should be regarded as a necessity, not a luxury; that the best fruit market on earth is found at your own table; that the best strawberries ever flavored with Jersey cream or frosted with sugar may be grown at small cost in your own garden; and that such fruits are not too good for the members of your household.

**Mississippi Nurseries, 1910-1911.**

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| A. C. Ball, Mantee.               | The Newton Nurseries, Newton.     |
| J. C. Barton, Booneville.         | Ocean Springs Pecan Co.,          |
| I. E. Bass & Sons Pecan Co.,      | Ocean Springs.                    |
| Lumberton.                        | Peachwood Nurseries, State Line.  |
| Bechtel Pecan Nurseries, Ocean    | Ramsey Pecan Co., Ocean Sp'gs.    |
| Springs.                          | W. P. Ramsay, Seymour.            |
| V. J. Bell, Grady.                | The Rosebud Nursery, Kilmichael.  |
| D. C. Benton, Lakeview.           | Southern Floral Nursery Co.,      |
| James Brodie, Biloxi.             | Bucatunna.                        |
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| The Corinth Nurseries, Corinth.   | Ocean Springs.                    |
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| I. P. Delmas, Scranton.           | M. J. Taylor, Scranton.           |
| The Eupora Nursery, Eupora.       | Toomsuba Nurseries, Toomsuba.     |
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| L. E. Hall, Scranton and Hatties- | Roseacres                         |
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## AVAILABLE BULLETINS AND CIRCULARS.

The following bulletins and circulars of the Station may be had on request:

## No.

## BULLETINS.

- 60—Value of Cotton Seed to the Farmer.
- 83—Report of Work at McNeill Branch Station for 1903.
- 84—Report of Field Work at College Station for 1903.
- 90—San José Scale.
- 91—Inspection and Analyses of Commercial Fertilizers.
- 92—Beef Cattle.
- 93—Peach and Plum Culture.
- 94—Report of Work at McNeill Branch Station for 1905.
- 95—The Dairy Cow.
- 99—Fertilizers.
- 100—Farmers' Institute Bulletin, 1906.
- 104—Inspection and Analyses of Cotton-Seed Meal.
- 107—Pork Production at the Delta Station.
- 111—Experiments in Feeding Dairy Cows.
- 114—Inspection and Analyses of Cotton-Seed Meal.
- 119—Report of Work at the Delta Branch Station for 1907 and 1908.
- 121—Experiments in Feeding Beef Steers.
- 122—Report of Work at the Holly Springs Branch Station for 1908.
- 125—Inspection and Analyses of Commercial Feeding Stuffs.
- 127—Inspection and Analyses of Cottonseed Meal.
- 128—Inspection and Analyses of Cottonseed Meal.
- 129—Sugar Cane for Syrup Making.
- 132—The Soils of Mississippi.
- 133—Inspection and Analyses of Commercial Feeding Stuffs.
- 134—Broom Corn.
- 135—Cotton 1909.
- 136—Feeding Beef Steers on Cottonseed Meal, on Pasture.
- 137—Inspection and Analyses of Commercial Feeding Stuffs.
- 138—Inspection and Analyses of Commercial Feeding Stuffs.
- 139—The Boll Weevil in Mississippi, 1909.
- 140—Cotton Diseases in Mississippi.
- 141—Control of Diseases of Fruits, Flowers and Vegetables.
- 142—Inspection and Analyses of Commercial Fertilizers.
- 143—Inspection and Analyses of Cottonseed Meal.
- 144—Inspection and Analyses of Commercial Feeding Stuffs.
- 145—Inspection and Analyses of Commercial Feeding Stuffs.
- 146—Suggestions for Growing Home Fruits.
- 147—Apple Growing in Mississippi.

## TECHNICAL BULLETINS.

- 2—Some Scale Insects of Mississippi and Texas.

## CIRCULARS.

- Asparagus.
- Blackleg.
- Boll Weevil.
- Insect Pest Law.
- Underground Waters of Mississippi.
- Hairy Vetch.

Address, AGRICULTURAL EXPERIMENT STATION, Agricultural College, Miss.

Mississippi Agricultural Experiment Station  
Agricultural College, Mississippi

BULLETIN No. 147.

APPLE GROWING IN MISSISSIPPI

By H. C. THOMPSON.



FIG. 1. Twelve year old Black Ben Davis Apple Tree in full blossom, Starkville, Miss. Tree good shape, but branches a little too thick.

AGRICULTURAL COLLEGE, MISSISSIPPI.

APRIL, 1911.

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# APPLE GROWING IN MISSISSIPPI.



## Introduction.

The apple is the most popular fruit grown. It is adapted to a very wide range of conditions, being grown in every state in the Union. It may be kept in the fresh state the whole year, ships well, and is used in more different ways than any other fruit. Like all other plants the apple tree responds to good care and attention. For best development, a cool climate is essential, but some varieties produce good crops of fruit in the warm parts of this country.

The demand for first class apples was never greater than at present and this demand is increasing. It now greatly exceeds the supply. Within the last fifteen years the production of apples has greatly decreased. In 1896 there were produced in the United States about 69,000,000 barrels, while in 1908, about 23,000,000 and probably less in 1909 than in 1908. Why this great falling off in production? The answer to this question is very evident to those who know the history of the apple industry in the East. Not long ago nearly every farm had its orchard and some of them were quite large. These old farm orchards supplied most of the market demand, for large commercial orchards were practically unknown. The rapid spread of destructive insects and diseases of fruits, within recent years, has forced the general farmer to abandon this type of orchard.

**The future of the apple industry.**—The market apples of the future will be produced by specialists, men who will devote their time and thoughts to the study of the problem. This change may be looked upon as a step in advance for specialization is an evidence of evolution and advancement. More and better fruit at a lower price will be the result.

Within the past decade more fruit trees have been planted than ever before and within a short time we may expect a great increase in the supply of apples.

**Why apples should be grown in Mississippi.**—Apple growing may never be of great commercial importance in Mississippi, but the writer



sees no reason why it should not be of much more importance than it now is. It has been demonstrated that good apples can be grown in the state and at a profit. Even if they could not be grown commercially there is no reason why the farmer cannot grow enough for home use. It is often said that apples can be bought cheaper than they can be grown in the South. Granting this to be true, can the farmer and others who would buy them get apples and good ones when they want them? Very few first-class apples reach the smaller towns in Mississippi. The bulk of the apples found on our local markets are No. 2's or culls. These have sold at times for two dollars and more per bushel by retail and found the demand at these prices greater than the supply. Can we not grow apples of better quality here at less cost? The writer thinks we can. Diversification is the keynote to success on the farm. Fruit should be regarded not as a luxury but as a necessary article of food. The sooner more of our farmers cultivate the habit of growing a greater variety of food crops at home the sooner we will be on the road to prosperity. The less we buy and the more of the surplus we sell the greater will be our progress.

**Location and site.**—For a commercial orchard it is important to be near a market if a home market is to be supplied, or near a good transportation line if a distant market is to be supplied. It is not essential to be near a market, for many of the large apple orchards are hundreds of miles from the markets they supply. It is important, however, to be near a good road and near a railroad, for hauling over a bad road bruises the fruit and thus injures its appearance and keeping qualities. Cost of hauling is considerable if the shipping point is many miles from the orchard. For a home orchard we select a location near the home because convenience is one of the many points to be considered.

The best site for an orchard is gently rolling land with a north or northeast slope. Always avoid flat land or valleys for cold air, being heavier than warm air, settles to the lower places and frost is more likely to kill the blossoms in such locations. If planted on the south side of a hill the trees will be warmed by the sun in spring, and, being protected from the cold north winds, will blossom early and may be killed by frosts. On the north slope the cold winds will keep them in a dormant condition longer or until danger of frost is past. Much of the land that is too hilly for profitable production of other crops will produce good crops of apples if given the proper care and attention. In

some sections apple growing is a profitable industry in the mountain regions, as in North Carolina. On such land terracing is important.

**Soils for apples.**—Apples will grow on a great variety of soils, but most kinds do best on deep, rich clays or loams. Soils very rich in nitrogen should be avoided as they will produce too much wood growth at the expense of fruit. Very few soils in Mississippi are too rich for apples, however. Many farmers plant their fruit trees on the poorest and roughest piece of land on the farm, because such soil will not produce any other crop profitably. If the trees do not produce good fruit in a few years, without any attention, the orchard is abandoned and the farmer says fruit growing is a failure. Does he expect this of other crops and has he a right to expect it of apples? Give apple trees the care and attention that other crops get and they will respond by producing profitable crops of fruit. It is a mistake to expect trees to grow well on poor soil for food is just as essential to tree growth as to the growth of cotton or corn. It requires a large quantity of food to produce a crop of trees and even a greater quantity to produce the fruit.

**Varieties to plant.**—The question of what varieties to plant is one of the hardest to answer, for some varieties are adapted to certain conditions while other varieties are not at all suited to those conditions. Whether selecting for a home or commercial orchard, would determine what varieties to plant. For commercial purposes we would select a few standard varieties of vigorous growing trees which bear well, and produce fruit of a good color and size that ripens evenly, stands storage, and ships well. These characteristics are sometimes found in varieties like the Ben Davis and Gano, which are very poor in quality. For home orchards we would choose a larger number of varieties with special reference to the quality, and without considering shipping properties or appearance.

There is only a limited number of varieties of apples adapted to the South and only a few of these have been tried in Mississippi. Among the varieties that are adapted to growing in this state are the following: Red June, Early Harvest, Red Astrachan, Yellow Transparent, Champion, Commerce, Black Ben Davis, Day, Yates, Horse, Roxbury Russett. The first four are early summer varieties while the others are either late summer or fall and winter varieties. There has been so little work done on the apple in this state that very little is known about its adaptability.

**Laying out the orchard.**—The soil should be well drained and thoroughly prepared, as for any other crop, before laying off the land for trees. A very common method used now is to mark off the rows and use a two horse breaking plow to open up the furrows. By running four times in the row, throwing the furrows both ways, very little extra digging will be necessary in setting the tree. Another method followed is to mark off the land by use of a string and set a stake where each hole is to be dug. Get a good strong line the length needed and stretch it to get out the elasticity, then tie a piece of red yarn tightly about the line at the exact distance the trees are to be planted apart. On a quiet day stretch this line tightly along one side of the field and set stakes at each mark, then stretch it across another side at right angles to the first and set stakes at each mark as before. Next mark the third exactly parallel to the second and then by placing the line between corresponding stakes on opposite sides of the field and setting stakes at each mark, straight rows will be insured. On land not level enough for this the stakes may be sighted in. This latter method was used by the writer in planting out an orchard on hilly, rough land and in consequence the rows are straight in each direction. The land was in sod and was not plowed at all. The sod mulch method, to be explained later, is being used.

On hilly land to be cultivated rows are usually run around the hill so as to prevent severe washing. The method of laying out such land is as follows: "If the slope is fairly regular—that is, with no 'draws' or 'coves'—one can measure up and down the hill and locate the end of the rows on a base line at each end of the piece. If the land is not very steep, one can start at a bottom corner and measure up the hill, laying off the rows according to the distance desired between the trees. If the trees are to be 35 feet apart, which is the least distance standard trees should be set, he will simply measure up the hill, using one of the end boundaries as a base line and put in a stake at every 35 feet. Measuring down the hill, he should check up his distances to see that each was exact. Each stake so set would mark the end of a row. The same measurements should be made up and down the hill on the other border of the piece. Using these end stakes as fixed points, a row of stakes could be sighted in between to make a straight line. The plow could then be started and a perfectly straight furrow, practically parallel with the hillside, put in from this line of stakes. As the plowing proceeded, a second row of sighting stakes should be set up to mark the next row to be plowed. In proceeding in this manner, the whole piece would be laid off in



exactly parallel furrows, running approximately parallel with the hillside. By making two rounds in each furrow the soil would be sufficiently plowed out, so that there would be very little more dirt to be thrown out with a shovel in planting the trees. In the highest and lowest furrows parallel stakes are set at every 35 feet. This marks the position of the trees in the first and last rows. From the second stake below a wire is reeled out and the end fastened tight to a stob driven in place of the second stake in the upper row. The wire is drawn tight between these two points and then slackened gradually till it conforms to the slope of the hill and rests on the ground in a straight line. Where the wire crosses the bottom of each parallel furrow will mark the spot where a tree is to be planted. The setting of the trees can now begin. While one man is distributing trees up or down the hillsides along the wire other men with shovels can be throwing out any extra dirt to make a proper hole for planting the trees. The wire can then be moved over the next two stakes, and planting of the next row proceed in the same manner. A bright wire affords a very handy means of marking out the rows, for in the sun it shows like a silver ribbon and can be seen perfectly even throughout a long stretch of land. If the land is steep the same method can be used, but instead of measuring off the 35 feet (the distance between two trees) on the slope it would be best to use a plumb line and level up, so that the 35 feet would be measured on the level instead of on the slope. On steep slopes, if some correction is not made for grade, it will be found that the rows are too close together. If the land is not too irregular, trees set out by this method will be found to 'checker up' pretty well every way."\*

In digging the holes use a short board, as shown in Fig. 2, which has a notch in the center and a hole at each end, equi-distant from

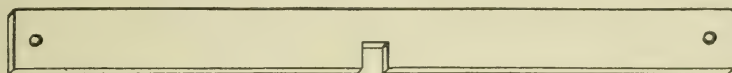


FIG. 2. Board used in planting to get tree in center of hole.

the center of the notch and on a line with it. Before beginning to dig place the board over the stake so that the center of the notch is in the position the tree is to occupy and put a peg through each hole in the ends. Remove board and center stake, but leave the outer pegs. Dig the hole and place the board back over the pegs and place the tree in the center of the notch.

\* N. C. Dept. of Agriculture, Vol. 29, Bulletin 8.



**Buying the trees.**—When possible to do so purchase trees directly from the nearest reliable nursery firm. The proprietors of such nurseries should furnish good trees at lower prices than the same goods can be had through an agent. The honest agent whose credentials show that he is doing good business for a reputable nursery is to be encouraged. Have no dealings with the unreliable tree peddler who is abroad in the land deceiving the people with exaggerated pictures, who buys up cull stock and mixed lots of seedlings not infrequently affected with diseases and insect pests, who represents such goods to be some new and superior fruit, and who sells his stock at several times the price our best nurserymen ask for first-class trees.

Nurserymen doing business in the state must have a certificate of inspection. Buy trees that have been inspected for dangerous parasites and look for certificate of inspection on the package.

Trees one year old from bud or graft are usually the proper age to plant, but some slow growing sorts may be two years old before planting. Under no circumstances should trees over two years old be planted for they receive a greater check in transplanting than younger trees and do not make as good growth. They are more likely to be broken in digging and packing and the cost of transportation is greater. Young trees can be pruned and trained to suit the ideals of the grower better than older trees for they will not have large branches on them.

**Planting the trees.**—Trees should be planted in the fall in the South as there is no danger of winter-killing from freezing and they start off better in the spring. The wounds heal or callus over and the roots are ready for work as soon as spring comes. By planting in the fall we avoid the rush of spring work. However, successful plantings are frequently made during mild weather in winter and as late as March 1st.

The distance for planting apple trees is not so great here as in the North, since the trees do not grow as large here as there. For most varieties 25 to 30 feet is sufficient. The tendency is toward closer planting than formerly in all sections of the country.

Too much care cannot be given to this important operation. No matter how well the land is prepared, nor what classes of trees one has, if they are not well planted best results will not be secured. Planting a tree does not consist simply in digging a hole and placing the tree in it and then filling the hole. Many trees are planted that way

and as a result they die the first year. Before planting, the tree should be pruned—both roots and branches. Cut off all broken and mangled

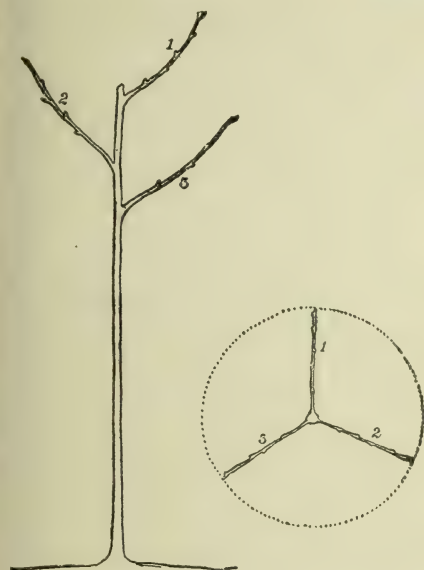


FIG. 3. Showing method of pruning to form head of tree. (Redrawn from U. S. Dept. of Agr., Farmers' Bulletin 181.)

roots and cut back roots that are too long to be well accommodated in the hole. Cut the root from the under side so that the cut surface will lie in contact with the soil below. Cut off all the branches except three or four scaffold branches which are to form the frame work of the tree and cut these back to about 8 to 10 inches. These branches should be well distributed up and down and around the trunk as shown in Fig. 3. The head should be formed low (18 inches from the ground) as it will then protect the trunk from sunscald, be more easily pruned and sprayed, and the fruit more easily gathered. A low headed tree is not so liable to be broken by wind-storms as a high headed tree.

When the trees are pruned and ready to plant it is a good plan to "puddle" the roots by dipping in a thin mud paste. This paste is made by mixing clay with water in a tub or barrel and is carried along on the wagon with the trees. Never allow the paste to dry on the roots before planting. Having the tree ready for planting throw in a little fresh soil and place the tree in the hole so that the graft is below the surface. Spread out the roots and throw in good fine soil, working it in around the roots with the hands. Pack the soil well by tramping until the hole is full, then put a little loose soil on top to prevent baking. Never cramp the roots, but have holes large enough to accommodate all but the longest.

**Cultivation of the orchard.**—Within recent years there has been considerable discussion of the best methods of culture for apples especially with reference to clean culture and sod mulch systems.

The clean culture method consists simply in keeping the land well cultivated during the growing season. This method is objec-

tionable because it leaves the land bare over winter and this allows the soil to run together and to wash badly. Plant food is also lost by this method as the tree ceases to grow before the summer is over and plant food which becomes available is lost by leaching or by being washed away.

The sod mulch method consists in having the orchard covered with sod and mulching the trees either with grass cut therefrom or with some other material. The objections to this method are that it takes up moisture and plant food needed by the trees and the mulch harbors disease organisms, insects, and rodents. With the exception of the matter of plant food these are legitimate objections. If the grass is left on the ground, as it should be, the plant food is returned. This method is justifiable on land that is subject to washing, and is even practiced very successfully on level land. One of the best orchards the writer has ever seen was in sod and had been all its life. The land had been a blue grass pasture for twenty years before the orchard was planted and now, forty years later, the sod has never been broken. Large holes were dug and after the trees were planted they were mulched with straw. All the grass that grew was cut down and raked up around the trees and other material was added when it could be secured. Nothing has ever been removed from this orchard except the fruit and a great deal of humus and plant food has been added.

Probably the best method for most soils in Mississippi would be a combination of clean culture and cover crops. The orchard should be well cultivated up to about midsummer, then sown down to cowpeas or some other leguminous crop. The cover crop takes up surplus plant food, takes up moisture in the fall, which causes the trees to mature their wood before winter, keeps the land from washing, and when plowed under during spring adds humus and nitrogen to the soil. Should nitrogen be plentiful in the soil a non-leguminous crop should be grown such as oats, rye, or rape, and these should be sown in the early fall.

**Cropping the orchard.**—The cropping of an orchard with other crops for purposes of revenue is justifiable only when the trees are young and do not need all of the space, and should be discontinued when the trees begin bearing regularly. The farmer is often forced to grow other crops to pay the expenses of the orchard before it begins to bear and, when this is done properly, it does not have had effects. As cropping is commonly done, however, trees are starved and crowded



out. The cause of the injury is that the grower neglects his trees and crops the orchard too heavily. When this method is followed nothing but cultivated crops should be used and then only those that are heavily manured, such as Irish potatoes, cabbage, or other garden crops. Grain and hay crops should not be removed from the orchard. Often the trees will get better cultivation by cropping the orchard than they would get otherwise as the farmer is likely to neglect the crop that does not bring in money. When planting the crop in the orchard as much as three feet should be left on both sides of the tree the first year and this space should be increased each year. Finally, there would be just a narrow space in the center between the rows that would be cropped. Whatever crop is grown the soil should be left in better condition after it is off than before it was planted. The cropping system is one that the writer hesitates to recommend because so many orchards are killed by heavy cropping. The grower is inclined to sacrifice his trees for the other crop because it is bringing in returns, whereas the grower should always have the welfare of his trees in mind and give them first consideration.

The system to be followed is the one that gives the best results in growing a crop of trees and fruit. Any method mentioned will be successful if the grower has the welfare of his trees in mind and makes everything else subordinate to them.

**Fertilization of the orchard.**—If the trees are growing vigorously and the foliage is of a bright green color no fertilizer will be necessary, but if they are stunted and the foliage is of a sickly yellowish color plant food should be added. The apple being a heavy feeder, cannot be expected to produce large crops of fruit indefinitely without the addition of fertilizers. Nitrogen, phosphoric acid, and potash may all be needed, but the nitrogen can be most economically supplied by planting cowpeas or some other leguminous crop. Phosphoric acid can be supplied in commercial fertilizers in the form of acid phosphate, or rock phosphate, and potash in the form of muriate or sulphate of potash. For most Mississippi soils potash will not likely be needed as it seems to be abundant in all soils that have been tested. The fertilizer should be applied in the spring when it can be taken up by the tree. Apply broadcast over the soil and harrow in or apply around the tree as far as the branches extend and work into the soil.

**Pruning.**—The tree that is properly pruned during the first two or three years of its life in the orchard will require very little severe pruning later on. The scaffold branches are selected at planting time or



the following season. These should be so pruned, after the first year, as to form an open head to permit free circulation of air and admit abundant sunlight. To secure this form the branches which grow toward the center are cut off and those growing from outside buds are left. Always remove one of the branches where two are growing close together. Where it is necessary to remove large limbs great care should be exercised to prevent splitting the branch or tearing the bark on the trunk or supporting branch. This can be accomplished by sawing part way through from the under side of the limb a foot or so from the supporting branch, then sawing from the top an inch or two in front of the under cut. After the branch is cut off the stub can be sawed off smoothly up near the trunk.

In all pruning the cut should be made as near the supporting part as possible, but the wound should be as small as it can be made; therefore, make the cut at right angles to the branch rather than parallel to the trunk. Large wounds should be covered with some antiseptic material which will keep out water and disease germs. Thick white lead paint or coal tar can be used for this purpose. If the wound does not heal over the first year give it a coat of paint or tar each succeeding year until it heals.

**Pruning for fruit.**—Where trees are in a healthy, growing condition and are not fruiting, pruning to check growth will stimulate fruit production. On the other hand, pruning may be used to prevent over-production when necessary. The fruit of the apple is borne on fruit spurs which develop from wood one year or more of age. By removal of some of these spurs, the trees are prevented from over bearing. Cut out all older spurs and those on the interior of the tree where there is insufficient light to give good color to the fruit and remove those from the trunk and larger branches. In removing such spurs we are protecting the tree from blight, which enters largely through the blossoms and soon passes back into the supporting branch. The remedy is to remove the diseased portions, but where the large limbs are affected this could not be done without serious injury to the tree. When the blight enters the smaller branches they can be removed without much loss.

**Pruning implements.**—As pruning leaves wounds on the tree it is desirable to have the cut surface as smooth as possible and the implement used should be the one that leaves the smoothest surface. For very small branches the pruning knife gives best results and for the next size the hand pruning shears. Branches too large for either the knife or hand shears can be removed with the lop shears, but



FIG. 4. Row of Black Ben Davis Apple Trees in full bloom in orchard of J. R. Storment, Starkville, Miss.

those over three-quarters of an inch in diameter should not be cut with the lop shears as they crush and injure the bark. For branches above this size use a pruning saw or a good hand saw. Wounds made by a saw are often dressed off smoothly by the use of a chisel, and this hastens healing.

**Insects and diseases of the apple.**—The apple is attacked by many diseases and insects and unless some protection is given first class fruit cannot be grown. Among the worst diseases are the bitter rot, apple scab, apple rust, fire blight, and crown gall. The principal insect enemies are the San José scale, round-headed and flat-headed apple-tree borers, codling moth, tent caterpillar, fall web-worm, canker worm, and bud moth. It is not likely that all these diseases and insects will be present at one time, but the grower should be able to recognize them so as to know what treatment to use and the time of application.

**Spraying.**—Spraying is one of the most important operations connected with the growing of apples and success depends largely on the proper application at the proper time and on the thoroughness of the work. As bitter rot is the worst enemy of the apple in most regions of Mississippi the later applications of a fungicide are very

important. During the season of 1910 the writer carried on experiments in controlling diseases and insects of the apple. In this work it was found that spraying at intervals of about two weeks from the time the fruit was half grown until it began to ripen controlled the bitter rot. The applications made before the fruit was half grown had little effect upon this disease, but was important in keeping the apple scab and other diseases in check. The writer suggests the following treatment for the apple based upon the past season's work and on general knowledge of the diseases and insects found working on the apple in Mississippi:

1. Spray with lime-sulphur wash during the winter if scale insects are present.

2. Spray with copper sulphate solution before buds open if the lime-sulphur wash is not applied.

3. Spray with Bordeaux mixture and arsenate of lead after leaf buds open but before flower buds open. This is for diseases or insects that affect the foliage early in the season.

4. Repeat No. 3 just after the petals drop. This is the important application for the codling moth and great care should be exercised to get the calyces of the young fruit filled with the mixture so that the insect will get a dose when he begins feeding. These insects enter the fruit largely from the calyx end.

5. Repeat No. 3 two weeks after No. 4.

6. Spray with Bordeaux mixture at intervals of about two weeks from the time the fruit is half grown until it begins to mature. These applications are absolutely essential to keep the bitter rot in check and unless this is done the fruit will be of little value.

Six or seven applications during the season will control all of the common diseases and insects found in Mississippi if these applications are made at the proper time. Trees sprayed six times during the past season yielded from 95 to 98 per cent perfect fruit (see Fig. 5) while those not sprayed at all or sprayed only once or twice early in the season gave about 95 per cent imperfect and unsound fruit. The difference between spraying and not spraying means the difference between profit and loss.

**Note.**—While Bordeaux mixture completely controlled the diseases it caused some russetting of the fruit and is somewhat objectionable for this reason. Experiments carried on in different parts of the country seem to indicate that the commercial brands of lime-sulphur





FIG. 5. Apple tree when fruit is nearly ripe. This tree was sprayed six times, and produced 95 per cent perfect fruit and held its foliage.

or the home-made lime-sulphur mixture will control the diseases of the apple without injuring the fruit. This work is not conclusive, however, and the writer would hesitate to recommend these mixtures until they have been further tried and proven without doubt. For formulae and method of preparation of the mixtures recommended in this bulletin, see bulletin 141 of this Station.

In addition to spraying it will be necessary to give the trees other attention in order to control diseases and insects. The apple tree borers cannot be reached by any insecticide so must be controlled by other means. The best method is to watch for the sawdust like castings around the base of the tree and then locate the burrow and dig out the insect with a sharp knife or kill it by running a wire in the hole and crushing the larva. If the trees are examined twice a year these insects can be kept in check with little expense or time.



## AVAILABLE BULLETINS AND CIRCULARS

The following bulletins and circulars of the Station may be had on request.

## No.

## BULLETINS.

- 60—Value of Cotton Seed to the Farmer.
- 83—Report of Work at McNeill Branch Station for 1903.
- 84—Report of Field Work at College Station for 1903.
- 90—San Jos Scale.
- 91—Inspection and Analyses of Commercial Fertilizers.
- 92—Beef Cattle.
- 93—Peach and Plum Culture.
- 94—Report of Work at McNeill Branch Station for 1905.
- 95—The Dairy Cow.
- 100—Farmers' Institute Bulletin, 1906.
- 104—Inspection and Analyses of Cotton Seed Meal.
- 107—Pork Production at the Delta Station.
- 114—Inspection and Analyses of Cotton Seed Meal.
- 119—Report of Work at the Delta Branch Station for 1907 and 1908.
- 121—Experiments in Feeding Beef Steers.
- 122—Report of Work at the Holly Springs Branch Station for 1908.
- 125—Inspection and Analyses of Commercial Feeding Stuffs.
- 127—Inspection and Analyses of Cotton Seed Meal.
- 128—Inspection and Analyses of Cotton Seed Meal.
- 129—Sugar Cane for Syrup Making.
- 132—The Soils of Mississippi.
- 133—Inspection and Analyses of Commercial Feeding Stuffs.
- 134—Broom Corn.
- 135—Cotton 1909.
- 136—Feeding Beef Steers on Cotton Seed Meal; on Pasture.
- 137—Inspection and Analyses of Commercial Feeding Stuffs.
- 138—Inspection and Analyses of Commercial Feeding Stuffs.
- 139—The Boll Weevil in Mississippi, 1909.
- 140—Cotton Diseases in Mississippi.
- 141—Control of Disease of Fruits, Flowers and Vegetables.
- 142—Inspection and Analyses of Commercial Fertilizers.
- 143—Inspection and Analyses of Cotton Seed Meal.
- 144—Inspection and Analyses of Commercial Feeding Stuffs.
- 145—Inspection and Analyses of Commercial Feeding Stuffs.
- 146—Suggestions for Growing Home Fruits.
- 147—Apple Growing in Mississippi.
- 148—Inspection and Analyses of Cotton Seed Meal.
- 149—Inspection and Analyses of Commercial Feeding Stuffs.

## TECHNICAL BULLETINS.

- 2—Some Scale Insects of Mississippi and Texas.

## CIRCULARS

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Blackleg.  
Boll Weevil.  
Insect Pest Law.  
Underground Waters of Mississippi.  
Hairy Vetch.

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BULLETIN No. 148.

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INSPECTION AND ANALYSES  
OF COTTONSEED MEAL

ON SALE IN MISSISSIPPI.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

JULY, 1911.

MISSISSIPPI FERTILIZER AND FEEDING STUFFS CONTROL.



INSPECTION OF COTTONSEED MEAL.



W. F. HAND.....	STATE CHEMIST
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J. C. McFARLAND.....	ASSISTANT CHEMIST
H. G. LEWIS.....	ASSISTANT CHEMIST
MARY MARY GAY.....	STENOGRAPHER

THE INSPECTION OF COTTONSEED MEAL.

Introduction.—This bulletin contains analyses of 246 samples of cottonseed meal drawn by regular inspectors from dealers in various parts of the state, and 82 analyses of samples received from manufacturers as representing the quality of meal sold and guaranteed.

The value of cottonseed meal, as a fertilizer and as a feeding stuff is measured most largely by the amount of **nitrogen** contained in it. Low grade meal is as undesirable for fertilizer purposes as it is for feeding. The analyses given here are sufficient to emphasize the fact that significant variations in quality occur. As long as "High Grade" meal is sold at approximately the same price, the wise purchaser will make an effort to secure the meal from those mills maintaining a high standard for their product, and he not only protects his interest in doing this, but he encourages for the public good the manufacturer who sells for the average price a product better than the average grade.

Dealers themselves should be interested in the quality of cottonseed meal as well as the margin of profit to be derived in handling. The analysis is the only guide available, and it is important that the farmer and feeder insist that dealers from whom they buy carry the best product obtainable for the price asked.

Comparison of values.—The price per ton of cottonseed meal is not always the index of its quality. The various grades of meal are made by the admixture of hulls, and the use of a large proportion of hulls than is necessary in the successful extraction of the oil presents no special advantage from the standpoint of the purchaser who may buy hulls in the open market with the assurance that a proper price is being paid.

It cannot be considered sufficient for a farmer and feeder to conclude that an arbitrary difference of, say, 50 cents to \$1.00 a ton is an approximate measure of the actual difference in value between two grades of meal, because the tables of analyses in this bulletin abound in illustrations of much wider variations.

If a "High Grade" meal containing, say, 6.30% of nitrogen can be bought for \$25.00 a ton a grade of meal containing as much as 6.90%

of nitrogen is worth \$27.50 a ton, while, on the same basis, meal carrying no more than 5.50% of nitrogen should be bought for about \$21.65 a ton. The lower grade of meal will contain the larger amount of hulls for which the buyer may pay the market price when purchased separately.

Table of comparative values.—The following table is inserted for the convenience of buyers in comparing values of various grades of meal. It is assumed that meal containing 6.40% of nitrogen can be bought for \$25.00 a ton.

If meal containing 6.40 per cent. of nitrogen is worth \$25.00 a ton.

Meal containing 7.20% of nitrogen is worth approximately	\$28.12
Meal containing 7.10% of nitrogen is worth approximately	27.73
Meal containing 7.00% of nitrogen is worth approximately	27.34
Meal containing 6.90% of nitrogen is worth approximately	26.95
Meal containing 6.80% of nitrogen is worth approximately	26.56
Meal containing 6.70% of nitrogen is worth approximately	26.17
Meal containing 6.60% of nitrogen is worth approximately	25.78
Meal containing 6.50% of nitrogen is worth approximately	25.39
Meal containing 6.40% of nitrogen is worth approximately	25.00
Meal containing 6.30% of nitrogen is worth approximately	24.61
Meal containing 6.20% of nitrogen is worth approximately	24.22
Meal containing 6.10% of nitrogen is worth approximately	23.83
Meal containing 6.00% of nitrogen is worth approximately	23.44
Meal containing 5.90% of nitrogen is worth approximately	23.05
Meal containing 5.80% of nitrogen is worth approximately	22.66
Meal containing 5.70% of nitrogen is worth approximately	22.27
Meal containing 5.50% of nitrogen is worth approximately	21.48
Meal containing 5.25% of nitrogen is worth approximately	20.51
Meal containing 5.00% of nitrogen is worth approximately	19.53
Meal containing 3.50% of nitrogen is worth approximately	13.67

General results of the inspection.—With comparatively few exceptions the analyses show that manufacturers have supplied meal well above guarantee. The mills generally are to be congratulated upon the excellent standard fixed by these analyses. It is gratifying also to be able to remind purchasers that the results of the inspection last season were no less encouraging.

There are only 17 samples of the 246 analyzed shown to be deficient, and with three or four exceptions these deficiencies are almost negligible.

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	ANGUILLA OIL & GIN COMPANY, Anguilla, Miss.	
16403	H. G. Cottonseed Meal	Anguilla Oil & Gin Co., Anguilla.....
16528	H. G. Cottonseed Meal.....	Anguilla Oil & Gin Co., Anguilla.....
	ARCOLA OIL MILL, Arcola, Miss.	
16401	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola.....
16527	H. G. Cottonseed Meal.....	Arcola Oil Mill, Arcola.....
	BARBER & LEWIS OIL CO., Edwards, Miss.	
16417	H. G. Cottonseed Meal.....	Barber & Lewis Oil Co., Edwards.....
16456	H. G. Cottonseed Meal.....	T. B. Gaddis, Morton.....
16547	H. G. Cottonseed Meal.....	Chas. Halsmith, Bolton.....
16548	H. G. Cottonseed Meal.....	Barber & Lewis Oil Co., Edwards.....
	H. E. BRIDGES & COMPANY, Memphis, Tenn.	
16361	H. G. Cottonseed Meal.....	P. B. Furr, Oxford.....
	BROOKHAVEN COTTON OIL & FERTILIZER CO., Brookhaven, Miss.	
16344	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
16345	H. G. Cottonseed Meal.....	Hattiesburg Groc. Co., Hattiesburg....
16347	H. G. Cottonseed Meal.....	B'ven Cot. Oil & Fert Co., Brookhaven
16423	H. G. Cottonseed Meal.....	B'ven Cot. Oil & Fert. Co., Brookhaven
16435	H. G. Cottonseed Meal.....	Hattiesburg Groc. Co., Hattiesburg....
16460	H. G. Cottonseed Meal.....	Louis Cohn & Bros., Brookhaven.....
16422	S. G. Cottonseed Meal	B'ven Cot. Oil & Fert Co., Brookhaven
	BUCKEYE COTTON OIL CO., Greenwood, Miss.	
16366	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood....
16390	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood....
16516	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Greenwood....
	BUCKEYE COTTON OIL CO., Jackson, Miss.	
16352	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Jackson.....
16431	H. G. Cottonseed Meal.....	Buckeye Cotton Oil Co., Jackson.....
16457	H. G. Cottonseed Meal.....	T. M. Steele & Sons, Forest.....
16461	H. G. Cottonseed Meal.....	H. A. Brown, Magee.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16403	10.20	6.99	6.18	8.50	7.51	29.71	26.27
16528	7.05	6.60	6.18	8.02	7.51	28.05	26.27
16401	8.92	6.22	6.18	7.56	7.51	26.44	26.27
16527	8.85	6.87	6.18	8.35	7.51	29.20	26.27
16417	9.85	6.41	6.18	7.79	7.51	27.24	26.27
16456	9.37	6.60	6.18	8.02	7.51	28.05	26.27
16547	9.52	6.63	6.18	8.06	7.51	28.18	26.27
16548	9.18	6.54	6.18	7.95	7.51	27.80	26.27
16361	9.35	6.80	6.18	8.27	7.51	28.90	26.27
16344	8.74	6.59	6.18	8.01	7.51	28.01	26.27
16345	8.49	6.89	6.18	8.38	7.51	29.28	26.27
16347	9.29	6.15	6.18	7.48	7.51	26.14	26.27
16423	7.49	6.76	6.18	8.22	7.51	28.73	26.27
16435	7.80	6.38	6.18	7.76	7.51	27.12	26.27
16460	9.11	6.40	6.18	7.78	7.51	27.20	26.27
16422	7.12	5.65	4.95	6.87	6.02	24.01	21.04
16366	9.06	6.20	6.18	7.54	7.51	26.35	26.27
16390	8.58	6.18	6.18	7.51	7.51	26.27	26.27
16516	8.04	6.47	6.18	7.87	7.51	27.50	26.27
16352	9.33	6.71	6.18	8.16	7.51	28.52	26.27
16431	8.60	6.58	6.18	8.00	7.51	27.97	26.27
16457	8.38	7.20	6.18	8.75	7.51	30.60	26.27
16461	8.11	6.61	6.18	8.04	7.51	28.09	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
16462	H. G. Cottonseed Meal.....	Gaddis & Slay Co., Magee.....
16465	H. G. Cottonseed Meal.....	J. B. Ware, Farmers Warehouse Manager, Taylorsville.....
16473	H. G. Cottonseed Meal.....	The Rankin Co., Columbia.....
16474	H. G. Cottonseed Meal.....	Columbia Groc. Co., Columbia.....
16479	H. G. Cottonseed Meal.....	Kennedy & Co., Wiggins.....
16489	H. G. Cottonseed Meal.....	Farmers Warehouse Co., Ellisville.....
16494	H. G. Cottonseed Meal.....	McLain & Tatum, Gloster.....
16504	H. G. Cottonseed Meal.....	The Rankin Co., Columbia.....
16557	H. G. Cottonseed Meal.....	Farmers Union Warehouse, Newton....
CANTON OIL MILL COMPANY, Canton, Miss.		
16355	H. G. Cottonseed Meal.....	Canton Oil Mill Co., Canton.....
16356	H. G. Cottonseed Meal.....	Durant Ice & Coal Co., Durant.....
16416	H. G. Cottonseed Meal.....	Canton Oil Mill Co., Canton.....
16496	H. G. Cottonseed Meal.....	Lotterhos & Huber Co., Crystal Sp'gs
CENTRAL COTTON OIL COMPANY Jackson, Miss.		
16354	H. G. Cottonseed Meal.....	Central Cotton Oil Co., Jackson.....
16415	H. G. Cottonseed Meal.....	T. S. Turner, Canton.....
16428	H. G. Cottonseed Meal.....	R. H. Green & Bro., Jackson.....
16433	H. G. Cottonseed Meal.....	Central Cotton Oil Co, Jackson.....
16436	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
16440	H. G. Cottonseed Meal.....	J. F. Wilson, Philadelphia.....
16466	H. G. Cottonseed Meal.....	Holloway & McRaney, Collins.....
16471	H. G. Cottonseed Meal.....	The Lampton Co., Columbia.....
16472	H. G. Cottonseed Meal.....	Conner Vaughn Co., Columbia.....
16493	H. G. Cottonseed Meal.....	R. H. Green & Bro., Jackson.....
16505	H. G. Cottonseed Meal.....	The Lampton Co., Columbia.....
16512	H. G. Cottonseed Meal.....	W. E. Laird, Hattiesburg.....
CLAY COUNTY COTTON OIL CO., West Point, Miss.		
16371	H. G. Cottonseed Meal.....	Clay County Cot. Oil Co., West Point
COLDWATER COTTON OIL CO., Coldwater, Miss.		
16382	H. G. Cottonseed Meal.....	Coldwater Cotton Oil Co., Coldwater
CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. COMPANY, Crystal Springs, Miss.		
16348	H. G. Cottonseed Meal.....	Crystal Springs Oil Mill, Fert. & M'f'g. Co., Crystal Springs.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16462	8.03	7.01	6.18	8.52	7.51	29.79	26.27
16465	8.52	6.04	6.18	7.34	7.51	25.67	26.27
16473	9.66	7.07	6.18	8.60	7.51	30.05	26.27
16474	9.77	6.83	6.18	8.30	7.51	29.03	26.27
16479	7.91	6.72	6.18	8.17	7.51	28.56	26.27
16489	8.30	6.93	6.18	8.43	7.51	29.45	26.27
16494	8.40	6.55	6.18	7.96	7.51	27.84	26.27
16504	8.91	6.58	6.18	8.00	7.51	27.97	26.27
16557	8.57	6.43	6.18	7.82	7.51	27.33	26.27
16355	8.66	6.88	6.18	8.36	7.51	29.24	26.27
16356	8.14	6.88	6.18	8.36	7.51	29.24	26.27
16416	8.98	7.00	6.18	8.51	7.51	29.75	26.27
16496	8.11	6.74	6.18	8.19	7.51	28.65	26.27
16354	8.72	6.81	6.18	8.28	7.51	28.94	26.27
16415	9.97	6.44	6.18	7.83	7.51	27.37	26.27
16428	9.37	6.55	6.18	7.96	7.51	27.84	26.27
16433	8.87	6.43	6.18	7.82	7.51	27.33	26.27
16436	8.85	6.66	6.18	8.10	7.51	28.31	26.27
16440	9.26	6.70	6.18	8.15	7.51	28.48	26.27
16466	5.58	6.43	6.18	7.82	7.51	27.33	26.27
16471	10.42	6.38	6.18	7.76	7.51	27.12	26.27
16472	10.51	6.38	6.18	7.76	7.51	27.12	26.27
16493	9.85	6.23	6.18	7.57	7.51	26.48	26.27
16505	9.79	6.53	6.18	7.94	7.51	27.75	26.27
16512	10.17	6.73	6.18	8.18	7.51	28.60	26.27
16371	10.59	6.80	6.18	8.27	7.51	28.90	26.27
16382	10.26	6.60	6.18	8.02	7.51	28.05	26.27
16348	8.27	7.11	6.18	8.64	7.51	30.22	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
16425	H. G. Cottonseed Meal.....	Crystal Springs Oil Mill, Fert. & M'f'g. Co., Crystal Springs.....
16497	H. G. Cottonseed Meal.....	Lotterhos & Huber Co., Crystal Sp'gs.....
	DEESON OIL MILL, Deeson, Miss.	
16395	S. G. Cottonseed Meal.....	Deeson Oil Mill, Deeson.....
16538	S. G. Cottonseed Meal.....	Deeson Oil Mill, Deeson.....
	DELTA OIL COMPANY, Greenville, Miss.	
16407	S. G. Cottonseed Meal.....	Delta Oil Co., Greenville.....
16525	S. G. Cottonseed Meal.....	Delta Oil Co., Greenville.....
	DeSOTO OIL COMPANY, Greenville, Miss.	
16409	H. G. Cottonseed Meal.....	DeSoto Oil Co., Greenville.....
16523	H. G. Cottonseed Meal.....	DeSoto Oil Co., Greenville.....
	EAGLE COTTON OIL COMPANY, Meridian, Miss.	
16231	H. G. Cottonseed Meal.....	J. K. Kirkland, Quitman.....
16335	H. G. Cottonseed Meal.....	Eagle Cotton Oil Co., Meridian.....
16447	H. G. Cottonseed Meal.....	Threefoot Bros. & Co., Meridian.....
16449	H. G. Cottonseed Meal.....	Eagle Cotton Oil Co., Meridian.....
16455	H. G. Cottonseed Meal.....	H. N. Stuart & Sons, Morton.....
16459	H. G. Cottonseed Meal.....	Forest Gin & M'f'g. Co., Forest.....
16492	H. G. Cottonseed Meal.....	M. H. Turner, Vossburg.....
16550	H. G. Cottonseed Meal.....	H. N. Stewart & Sons, Morton.....
16554	H. G. Cottonseed Meal.....	Wetherbee-Huggins Co., Waynesboro.....
16559	H. G. Cottonseed Meal.....	W. H. Gallaspy's Sons Co., Hickory.....
16560	H. G. Cottonseed Meal.....	O. Hopkins, Hickory.....
	EASTMAN OIL MILLS, Jonestown, Miss.	
16534	H. G. Cottonseed Meal.....	Eastman Oil Mills, Jonestown.....
	FRIARS POINT OIL MILL & M'F'G. COMPANY, Friars Point, Miss.	
16539	S. G. Cottonseed Meal.....	Friars Point Oil Mill & M'f'g. Co., Friars Point.....
	A. H. GEORGE & COMPANY, Meridian, Miss.	
16555	H. G. Cottonseed Meal.....	Queen City Feed Co., Meridian.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found—Per Cent.	Nitrogen Guaranteed—Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16425	6.45	7.39	6.18	8.98	7.51	31.41	26.27
16497	7.07	7.15	6.18	8.69	7.51	30.39	26.27
16395	9.76	6.43	5.50	7.82	6.69	27.33	23.38
16538	8.34	6.53	5.50	7.94	6.69	27.75	23.38
16407	8.30	5.45	4.95	6.63	6.02	23.16	21.04
16525	6.07	7.52	4.95	6.95	6.02	24.31	21.04
16409	8.53	6.68	6.18	8.12	7.51	28.39	26.27
16523	9.19	6.27	6.18	7.62	7.51	26.65	26.27
16231	6.79	6.87	6.18	8.35	7.51	29.20	26.27
16335	8.22	6.31	6.18	7.67	7.51	26.82	26.27
16447	8.57	6.56	6.18	7.98	7.51	27.88	26.27
16449	8.30	6.38	6.18	7.76	7.51	27.12	26.27
16455	7.35	7.09	6.18	8.62	7.51	30.13	26.27
16459	9.07	6.40	6.18	7.78	7.51	27.20	26.27
16492	8.25	6.49	6.18	7.89	7.51	27.58	26.27
16550	7.97	6.92	6.18	8.41	7.51	29.41	26.27
16554	8.96	6.48	6.18	7.88	7.51	27.54	26.27
16559	9.14	6.44	6.18	7.83	7.51	27.37	26.27
16560	9.20	6.53	6.18	7.94	7.51	27.75	26.27
16534	9.78	6.67	6.18	8.11	7.51	28.35	26.27
16539	7.52	6.88	5.50	8.36	6.69	29.24	23.38
16555	9.48	6.65	6.18	8.09	7.51	28.26	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	GLEN ALLAN OIL MILL, Glen Allan, Miss.	
16419	H. G. Cottonseed Meal.....	C. J. Edwards Co., Vicksburg.....
16529	H. G. Cottonseed Meal.....	Glen Allan Oil Mill, Glen Allan.....
	GRENADA OIL MILL, Grenada, Miss.	
16358	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
16360	H. G. Cottonseed Meal.....	F. S. Leavell, Oxford.....
16385	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
16542	H. G. Cottonseed Meal.....	Grenada Oil Mill, Grenada.....
	HAZLEHURST OIL MILL & FERTI- LIZER COMPANY, Hazlehurst, Miss.	
16349	H. G. Cottonseed Meal.....	Hazlehurst Oil Mill & Fert. Co., H'hurst.....
16427	H. G. Cottonseed Meal.....	H'hurst Oil Mill & Fert. Co., Hazlehurst.....
16463	H. G. Cottonseed Meal.....	Walker Company, Taylorsville.....
16500	H. G. Cottonseed Meal.....	W. A. Holloway, Mt. Olive.....
	HOLLANDALE COTTON OIL MILL, Hollandale, Miss.	
16400	H. G. Cottonseed Meal.....	Hollandale Cotton Oil Mill, Hollandale.....
16526	H. G. Cottonseed Meal.....	Hollandale Cotton Oil Mill, Hollandale.....
	HOLLYWOOD OIL MILL, Hollywood, Miss.	
16394	H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
16536	H. G. Cottonseed Meal.....	Hollywood Oil Mill, Hollywood.....
	IMPERIAL COTTON OIL COMPANY, Macon, Miss.	
16451	H. G. Cottonseed Meal.....	Imperial Cotton Oil Co., Macon.....
16556	H. G. Cottonseed Meal.....	J. L. Long, Meridian.....
	INDIANOLA COTTON OIL CO., Indianola, Miss.	
16408	S. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola.....
16520	S. G. Cottonseed Meal.....	Indianola Cotton Oil Co., Indianola.....
	ITTA BENA COTTON OIL CO., Itta Bena, Miss.	
16365	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena.....
16389	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena.....
16519	H. G. Cottonseed Meal.....	Itta Bena Cotton Oil Co., Itta Bena.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16419	9.35	6.29	6.18	7.65	7.51	26.73	26.27
16529	8.60	6.80	6.18	8.27	7.51	28.90	26.27
16358	10.69	6.28	6.20	7.64	7.54	26.69	26.35
16360	10.97	6.78	6.20	8.24	7.54	28.82	26.35
16385	9.12	6.65	6.20	8.09	7.54	28.26	26.35
16542	9.71	6.50	6.20	7.90	7.54	27.63	26.35
16349	7.10	7.24	6.18	8.80	7.51	30.77	26.27
16427	7.00	7.24	6.18	8.80	7.51	30.77	26.27
16463	8.15	7.47	6.18	9.08	7.51	31.75	26.27
16500	7.96	7.27	6.18	8.84	7.51	30.90	26.27
16400	8.36	6.93	6.18	8.43	7.51	29.45	26.27
16526	8.66	6.95	6.18	8.45	7.51	29.54	26.27
16394	12.38	6.57	6.18	7.99	7.51	27.92	26.27
16536	10.04	6.02	6.18	7.32	7.51	25.59	26.27
16451	7.63	6.64	6.18	8.07	7.51	28.22	26.27
16556	7.97	6.27	6.18	7.62	7.51	26.65	26.27
16408	8.28	6.65	4.95	8.09	6.02	28.26	21.04
16520	7.58	6.58	4.95	8.00	6.02	27.97	21.04
16365	9.24	6.14	6.18	7.47	7.51	26.10	26.27
16389	7.96	6.65	6.18	8.09	7.51	28.26	26.27
16519	7.93	6.34	6.18	7.71	7.51	26.95	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
JACKSON OIL & REFINING CO., Jackson, Miss.		
16353	H. G. Cottonseed Meal	Jackson Oil & Refining Co., Jackson....
16432	H. G. Cottonseed Meal	Jackson Oil & Refining Co., Jackson....
16468	H. G. Cottonseed Meal	Conner-Lumber Co., Seminary.....
16481	H. G. Cottonseed Meal	Biloxi Milling Co., Biloxi.....
16495	H. G. Cottonseed Meal	W. L. Dees, Crystal Springs.....
16511	H. G. Cottonseed Meal	Merchants Grocery Co., Hattiesburg
16551	H. G. Cottonseed Meal	Farmers Union Warehouse, Pelahatchie
LAUREL OIL & FERTILIZER CO., Laurel, Miss.		
16340	Extra H. G. Cottonseed Meal ..	Laurel Oil & Fert. Co., Laurel.....
16437	Extra H. G. Cottonseed Meal....	Laurel Oil & Fert. Co., Laurel.....
16441	Extra H. G. Cottonseed Meal....	J. F. Wilson, Philadelphia.....
16464	Extra H. G. Cottonseed Meal....	E. B. Perry, Taylorsville.....
16470	Extra H. G. Cottonseed Meal....	S. G. Armstrong Merc. Co., Oakvale...
16477	Extra H. G. Cottonseed Meal....	W. M. Hyde & Co., Poplarville.....
16486	Extra H. G. Cottonseed Meal....	Jeff Griffiths Merc. Co., Beaumont....
16491	Extra H. G. Cottonseed Meal....	K. F. Huddleston, Heidelberg.....
16507	Extra H. G. Cottonseed Meal....	Goss & Wilkes, Columbia.....
16565	Extra H. G. Cottonseed Meal....	Farmers Warehouse Co., Richton.....
16341	H. G. Cottonseed Meal	Laurel Oil & Fert. Co., Laurel.....
16438	H. G. Cottonseed Meal	Laurel Oil & Fert. Co., Laurel.....
16487	H. G. Cottonseed Meal	Ovett Merc. Co., Ovett.....
16514	H. G. Cottonseed Meal	W. W. Pigford, Lumberton.....
16566	H. G. Cottonseed Meal	J. J. Bradford & Co., Ovett.....
LELAND OIL WORKS, Leland, Miss.		
16402	S. G. Cottonseed Meal	Leland Oil Works, Leland.....
16521	S. G. Cottonseed Meal	Leland Oil Works, Leland.....
LEXINGTON COTTON OIL CO., Lexington, Miss.		
16575	H. G. Cottonseed Meal	Wm. Atkinson & McDonald Co., Wes'n
16357	H. G. Cottonseed Meal	Lexington Cotton Oil Co., Lexington
16413	H. G. Cottonseed Meal	Lexington Cotton Oil Co., Lexington
16515	H. G. Cottonseed Meal	Lexington Cotton Oil Co., Lexington
MERIDIAN FERT. FACTORY, Hattiesburg, Miss.		
16343	H. G. Golden-Rod Cottonseed Meal	Meridian Fert. Factory, Hattiesburg
16342	H. G. Cottonseed Meal	Meridian Fert. Factory, Hattiesburg
6469	H. G. Cottonseed Meal	R. Watts & Co., Seminary.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16353	9.20	7.08	6.18	8.61	7.51	30.09	26.27
16432	7.65	6.18	6.18	7.51	7.51	26.27	26.27
16468	9.92	6.93	6.18	8.43	7.51	29.45	26.27
16481	8.12	6.53	6.18	7.94	7.51	27.75	26.27
16495	7.78	6.47	6.18	7.87	7.51	27.50	26.27
16511	8.16	6.99	6.18	8.50	7.51	29.71	26.27
16551	9.15	6.85	6.18	8.33	7.51	29.11	26.27
16340	7.14	6.75	6.56	8.21	7.98	28.69	27.88
16437	8.13	6.77	6.56	8.23	7.98	28.77	27.88
16441	8.22	6.89	6.56	8.38	7.98	29.28	27.88
16464	9.13	6.94	6.56	8.44	7.98	29.50	27.88
16470	8.90	6.94	6.56	8.44	7.98	29.50	27.88
16477	10.50	6.96	6.56	8.46	7.98	29.58	27.88
16486	7.65	6.74	6.56	8.19	7.98	28.65	27.88
16491	7.95	6.68	6.56	8.12	7.98	28.39	27.88
16507	9.33	6.83	6.56	8.30	7.98	29.03	27.88
16565	9.58	6.48	6.56	7.88	7.98	27.54	27.88
16341	8.10	6.00	6.18	7.29	7.51	25.50	26.27
16438	8.19	6.52	6.18	7.93	7.51	27.71	26.27
16487	9.07	6.61	6.18	8.04	7.51	28.09	26.27
16514	9.99	6.34	6.18	7.71	7.51	26.95	26.27
16566	9.07	6.64	6.18	8.07	7.51	28.22	26.27
16402	9.43	6.85	4.95	8.33	6.02	29.11	21.04
16521	9.52	6.33	4.95	7.70	6.02	26.90	21.04
16575	9.15	6.21	6.18	7.55	7.51	26.39	26.27
16357	8.70	6.42	6.18	7.81	7.51	27.29	26.27
16413	9.61	6.58	6.18	8.00	7.51	27.97	26.27
16515	10.24	6.48	6.18	7.88	7.51	27.54	26.27
16343	8.82	6.59	6.59	8.01	8.01	28.01	28.01
16342	7.92	6.46	6.18	7.85	7.51	27.46	26.27
16469	9.84	6.49	6.18	7.89	7.51	27.58	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	MERIDIAN FERT. FACTORY, Meridian, Miss.	
16338	H. G. Golden Rod Cottonseed Meal.....	Meridian Fert. Factory, Meridian.....
16439	H. G. Golden Rod Cottonseed Meal.....	J. N. Tabor, Louisville.....
16476	H. G. Golden Rod Cottonseed Meal.....	Hawkins-McRaney Co., Bassfield.....
16506	H. G. Golden Rod Cottonseed Meal.....	Barnes Merc. Co., Columbia.....
16509	H. G. Golden Rod Cottonseed Meal.....	Sumrall Merc. Co., Sumrall.....
16564	H. G. Golden Rod Cottonseed Meal.....	C. H. Stevens & Co., Richton.....
16458	H. G. Cottonseed Meal.....	G. H. Story, Forest.....
16510	H. G. Cottonseed Meal.....	Hawkins-McRaney Co., Bassfield.....
	MINTER CITY OIL WORKS, Minter City, Miss.	
16368	S. G. Cottonseed Meal.....	Minter City Oil Works, Minter City....
16392	S. G. Cottonseed Meal.....	Minter City Oil Works, Minter City....
16540	S. G. Cottonseed Meal.....	Minter City Oil Works, Minter City....
	MISSISSIPPI COTTON OIL CO., Clarksdale, Miss.	
16370	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Clarksdale
16397	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Clarksdale
16533	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Clarksdale
	MISSISSIPPI COTTON OIL CO., Greenville, Miss.	
16410	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Greenville
16522	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Greenville
	MISSISSIPPI COTTON OIL CO., Grenada, Miss.	
16364	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Grenada....
16386	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Grenada....
16543	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Grenada....
	MISSISSIPPI COTTON OIL CO., Jackson, Miss.	
16346	H. G. Cottonseed Meal.....	Merchants Grocery Co., Hattiesburg....
16351	H. G. Cottonseed Meal.....	Mississippi Cotton Oil Co., Jackson....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16338	7.41	6.78	6.59	8.24	8.01	28.82	28.01
16439	8.52	6.90	6.59	8.39	8.01	29.33	28.01
16476	10.48	6.62	6.59	8.05	8.01	28.14	28.01
16506	7.96	7.09	6.59	8.51	8.01	29.75	28.01
16509	7.57	7.14	6.59	8.68	8.01	30.35	28.01
16564	7.73	6.88	6.59	8.36	8.01	29.24	28.01
16458	9.45	6.85	6.18	8.33	7.51	29.11	26.27
16510	8.11	6.52	6.18	7.93	7.51	27.71	26.27
16368	10.68	6.08	4.95	7.39	6.02	25.84	21.04
16392	10.55	6.67	4.95	8.11	6.02	28.35	21.04
16540	10.00	6.52	4.95	7.93	6.02	27.71	21.04
16370	10.76	5.99	6.18	7.28	7.51	25.46	26.27
16397	10.34	6.18	6.18	7.51	7.51	26.27	26.27
16533	10.59	5.91	6.18	7.19	7.51	25.12	26.27
16410	9.02	6.48	6.18	7.88	7.51	27.54	26.27
16522	7.76	6.41	6.18	7.79	7.51	27.24	26.27
16364	10.78	6.10	6.18	7.42	7.51	25.93	26.27
16386	10.26	6.37	6.18	7.74	7.51	27.07	26.27
16543	9.71	6.58	6.18	8.00	7.51	27.97	26.27
16346	10.04	5.79	6.18	7.04	7.51	24.61	26.27
16351	10.03	6.24	6.18	7.59	7.51	26.52	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
16430	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Jackson...
16434	H. G. Cottonseed Meal	Merchants Grocery Co., Hattiesburg
16445	H. G. Cottonseed Meal	Merchants Grocery Co., Hattiesburg
16454	H. G. Cottonseed Meal	Gallaspy Bros. & Co., Union
16475	H. G. Cottonseed Meal	D. C. Griffith, & Co. Silver Creek
16478	H. G. Cottonseed Meal	J. H. Adkison, McHenry
16480	H. G. Cottonseed Meal	J. K. Henly, Biloxi
16482	H. G. Cottonseed Meal	Corso & Tedesco, Biloxi
16483	H. G. Cottonseed Meal	M. M. Moody, Long Beach
16484	H. G. Cottonseed Meal	Hood Milling Co., Gulfport
16485	H. G. Cottonseed Meal	Gulfport Grocery Co., Gulfport
16498	H. G. Cottonseed Meal	Ross Bros. & Summer, Pelahatchie...
16501	H. G. Cottonseed Meal	Stewart & Hemeter, Seminary
16502	H. G. Cottonseed Meal	J. P. Cox Merc. Co., Pinola
16508	H. G. Cottonseed Meal	Rawls Byrne Co., Silver Creek
16513	H. G. Cottonseed Meal	W. E. Laird, Hattiesburg
16549	H. G. Cottonseed Meal	Gaddis, McLaurin & Greaves, Clinton
16429	S. G. Cottonseed Meal	Mississippi Cotton Oil Co., Jackson...
	MISSISSIPPI COTTON OIL CO., Meridian, Miss.	
16336	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Meridian...
16442	H. G. Cottonseed Meal	W. J. Brantley, Philadelphia
16450	H. G. Cottonseed Meal	Mississippi Cotton Oil Co., Meridian...
16488	H. G. Cottonseed Meal	Jones Co. Gin & Mfg. Co., Ellisville
16490	H. G. Cottonseed Meal	Johnson-Hand Co., Ellisville
16563	H. G. Cottonseed Meal	Bay Springs Feed & Wse. Co., B. Sp'gs
	MISSISSIPPI COTTON OIL CO., Yazoo City, Miss.	
16412	H. G. Cottonseed Meal	Miss. Cotton Oil Co., Yazoo City
16467	H. G. Cottonseed Meal	W. M. Biglane, Collins
16499	H. G. Cottonseed Meal	Lampton & Rawls Co., Mt. Olive
16503	H. G. Cottonseed Meal	E. M. Odom, Star
	NATCHEZ OIL COMPANY, Natchez, Miss.	
16421	H. G. Cottonseed Meal	Natchez Oil Co., Natchez
	NEWTON OIL & M'F'G. COMPANY, Newton, Miss.	
16085	H. G. Cottonseed Meal	J. T. Mitchell, Union
16236	H. G. Cottonseed Meal	C. H. Stevens & Co., Richton
16339	H. G. Cottonseed Meal	Newton Oil & M'f'g. Co., Newton
16558	H. G. Cottonseed Meal	Newton Oil & M'f'g. Co., Newton
16561	H. G. Cottonseed Meal	McMullan & Sons, Hickory
16562	H. G. Cottonseed Meal	Bay Spgs. Gin & Wse. Co., Bay Sp'gs

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16430	10.12	6.68	6.18	8.12	7.51	28.39	26.27
16434	8.55	6.26	6.18	7.61	7.51	26.61	26.27
16445	9.47	6.57	6.18	7.99	7.51	27.92	26.27
16454	8.86	6.41	6.18	7.79	7.51	27.24	26.27
16475	11.25	6.66	6.18	8.10	7.51	28.31	26.27
16478	9.13	6.33	6.18	7.70	7.51	26.90	26.27
16480	9.31	6.49	6.18	7.89	7.51	27.58	26.27
16482	8.76	6.60	6.18	8.02	7.51	28.05	26.27
16483	9.65	6.63	6.18	8.06	7.51	28.18	26.27
16484	8.61	6.30	6.18	7.66	7.51	26.78	26.27
16485	8.86	6.51	6.18	7.91	7.51	27.67	26.27
16498	8.92	6.19	6.18	7.53	7.51	26.31	26.27
16501	10.44	6.43	6.18	7.82	7.51	27.33	26.27
16502	9.50	6.04	6.18	7.34	7.51	25.67	26.27
16508	10.61	6.41	6.18	7.79	7.51	27.24	26.27
16513	9.94	6.95	6.18	8.45	7.51	29.54	26.27
16549	8.97	6.39	6.18	7.77	7.51	27.16	26.27
16429	10.36	5.94	4.95	7.22	6.02	25.25	21.04
16336	9.69	6.36	6.18	7.73	7.51	27.03	26.27
16442	10.64	6.07	6.18	7.38	7.51	25.80	26.27
16450	10.41	6.62	6.18	8.05	7.51	28.14	26.27
16488	10.72	6.91	6.18	8.40	7.51	29.37	26.27
16490	11.01	5.89	6.18	7.16	7.51	25.03	26.27
16563	11.36	6.52	6.18	7.93	7.51	27.71	26.27
16412	9.32	6.10	6.18	7.42	7.51	25.93	26.27
16467	9.73	6.46	6.18	7.85	7.51	27.46	26.27
16499	9.83	5.80	6.18	7.05	7.51	24.65	26.27
16503	9.59	5.95	6.18	7.23	7.51	25.29	26.27
16421	7.38	6.45	6.18	7.84	7.51	27.41	26.27
16085	6.59	7.01	6.18	8.52	7.51	29.79	26.27
16236	6.55	6.88	6.18	8.36	7.51	29.24	26.27
16339	8.78	6.38	6.18	7.76	7.51	27.12	26.27
16558	7.37	6.99	6.18	8.50	7.51	29.71	26.27
16561	8.88	6.97	6.18	8.47	7.51	29.62	26.27
16562	8.62	6.88	6.18	8.36	7.51	29.24	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	NORTH MISSISSIPPI OIL MILLS, Holly Springs, Miss.	
16379	H. G. Cottonseed Meal.....	North Miss. Oil Mills, Holly Springs....
	OKOLONA OIL COMPANY, Okolona, Miss.	
16377	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
16574	H. G. Cottonseed Meal.....	Okolona Oil Co., Okolona.....
	OXFORD OIL MILL COMPANY, Oxford, Miss.	
16359	H. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
16380	H. G. Cottonseed Meal.....	Oxford Oil Mill Co., Oxford.....
16381	H. G. Cottonseed Meal.....	P. B. Furr, Oxford.....
	PEOPLE'S COTTON OIL & FIBRE COMPANY, North Carrollton, Miss.	
16388	S. G. Cottonseed Meal.....	Peoples Cotton Oil & Fibre Co., North Carrollton.....
16518	S. G. Cottonseed Meal.....	People's Cotton Oil & Fibre Co., North Carrollton.....
	PEOPLE'S OIL MILL & FERTILIZER WORKS, Aberdeen, Miss.	
16372	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Works, Mill No. 1, Aberdeen.....
16373	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Works, Mill No. 2 Aberdeen.....
16567	H. G. Cottonseed Meal.....	Peoples Oil Mill & Fert. Works, Aberdeen.....
	PHOENIX COTTON OIL CO., Como, Miss.	
16363	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
16384	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
16545	H. G. Cottonseed Meal.....	Phoenix Cotton Oil Co., Como.....
	PLANTERS GIN & OIL COMPANY, Baldwyn, Miss.	
16375	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....
16570	H. G. Cottonseed Meal.....	Planters Gin & Oil Co., Baldwyn.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16379	9.11	7.01	6.18	8.52	7.51	29.79	26.27
16377	9.03	6.65	6.18	8.09	7.51	28.26	26.27
16574	8.71	6.77	6.18	8.23	7.51	28.77	26.27
16359	9.48	6.68	6.18	8.12	7.51	28.39	26.27
16380	8.31	6.60	6.18	8.02	7.51	28.05	26.27
16381	9.11	7.01	6.18	8.52	7.51	29.79	26.27
16388	9.52	6.15	5.40	7.48	6.57	26.14	22.95
16518	9.37	5.91	5.40	7.19	6.57	25.12	22.95
16372	7.77	6.97	6.18	8.47	7.51	29.62	26.27
16373	8.48	6.96	6.18	8.46	7.51	29.58	26.27
16567	7.75	6.71	6.18	8.16	7.51	28.52	26.27
16363	10.69	6.43	6.18	7.82	7.51	27.33	26.27
16384	9.75	6.59	6.18	8.01	7.51	28.01	26.27
16545	8.97	7.07	6.18	8.60	7.51	30.05	26.27
16375	9.79	7.14	6.18	8.68	7.51	30.35	26.27
16570	8.96	7.01	6.18	8.52	7.51	29.79	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	PLANTERS OIL MILL, Tunica, Miss.	
16369	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica
16393	H. G. Cottonseed Meal	Planters Oil Mill, Tunica.....
16535	H. G. Cottonseed Meal.....	Planters Oil Mill, Tunica.....
	PLANTERS OIL MILL & GIN CO., Kosciusko, Miss.	
16414	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
16452	H. G. Cottonseed Meal.....	Planters Oil Mill & Gin Co., Kosciusko
16453	H. G. Cottonseed Meal.....	Jackson-Wallace Co., Kosciusko.....
	PLANTERS OIL MILL & M'F'G. CO., Greenwood, Miss.	
16367	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., Greenw'd
16391	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., Greenw'd
16517	H. G. Cottonseed Meal.....	Planters Oil Mill & M'f'g. Co., Greenw'd
16553	H. G. Cottonseed Meal.....	J. K. Kirkland, Quitman.....
	PLANTERS OIL WORKS, Clarksdale, Miss.	
16396	S. G. Cottonseed Meal	Planters Oil Works, Clarksdale.....
16532	S. G. Cottonseed Meal	Planters Oil Works, Clarksdale.....
	PONTOTOC COTTON OIL CO., Pontotoc, Miss.	
16378	H. G. Cottonseed Meal.....	Pontotoc Cotton Oil Co., Pontotoc....
16443	H. G. Cottonseed Meal.....	Henderson-Molphus Co., Philadelphia
16444	H. G. Cottonseed Meal.....	E. P. Donald & Sons, Philadelphia....
	PORT GIBSON OIL WORKS, Port Gibson, Miss.	
16420	S. G. Cottonseed Meal	Port Gibson Oil Works, Port Gibson
	PRODUCERS COTTON OIL CO., Yazoo City, Miss.	
16411	H. G. Cottonseed Meal.....	Producers Cotton Oil Co., Yazoo City
16426	H. G. Cottonseed Meal.....	J. L. Gillaspy, Crystal Springs.....
	REFUGE COTTON OIL COMPANY, Greenville, Miss.	
16406	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Greenville.....
16524	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Greenville.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16369	8.66	6.64	6.50	8.07	7.90	28.22	27.63
16393	8.52	6.77	6.50	8.23	7.90	28.77	27.63
16535	9.10	6.59	6.50	8.01	7.90	28.01	27.63
16414	8.47	6.97	6.18	8.47	7.51	29.62	26.27
16452	8.67	7.12	6.18	8.66	7.51	30.26	26.27
16453	8.61	7.04	6.18	8.56	7.51	29.92	26.27
16367	9.55	6.44	6.18	7.83	7.51	27.37	26.27
16391	9.04	6.41	6.18	7.79	7.51	27.24	26.27
16517	9.75	6.22	6.18	7.56	7.51	26.44	26.27
16553	9.21	6.39	6.18	7.77	7.51	27.16	26.27
16396	8.35	7.09	5.00	8.62	6.08	30.13	21.25
16532	8.41	6.73	5.00	8.18	6.08	28.60	21.25
16378	8.65	7.08	6.18	8.61	7.51	30.09	26.27
16443	8.69	7.24	6.18	8.80	7.51	30.77	26.27
16444	8.41	7.26	6.18	8.83	7.51	30.86	26.27
16420	10.64	6.83	5.00	8.30	6.08	29.03	21.25
16411	9.33	6.05	6.18	7.36	7.51	25.71	26.27
16426	7.29	6.38	6.18	7.76	7.51	27.12	26.27
16406	9.43	6.39	4.95	7.77	6.02	27.16	21.04
16524	8.13	5.65	4.95	6.87	6.02	24.01	21.04

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
REFUGE COTTON OIL COMPANY, Rosedale, Miss.		
16405	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Rosedale.....
16537	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Rosedale.....
REFUGE COTTON OIL COMPANY, Vicksburg, Miss.		
16418	S. G. Cottonseed Meal	Refuge Cotton Oil Co., Vicksburg.....
RICHMOND COTTON OIL COMPANY, Corinth, Miss.		
16053	H. G. Cottonseed Meal	Richmond Cotton Oil Co., Corinth....
16374	H. G. Cottonseed Meal	Richmond Cotton Oil Co., Corinth....
16573	H. G. Cottonseed Meal	Farmers Warehouse Co., Iuka.....
ROLLING FORK OIL COMPANY, Rolling Fork, Miss.		
16404	S. G. Cottonseed Meal	Rolling Fork Oil Co., Rolling Fork...
SARDIS OIL COMPANY, Sardis, Miss.		
16383	H. G. Cottonseed Meal	Sardis Oil Co., Sardis.....
16362	S. G. Cottonseed Meal	Sardis Oil Co., Sardis.....
16544	S. G. Cottonseed Meal	Sardis Oil Co., Sardis.....
SHAW COTTON OIL COMPANY, Shaw, Miss.		
16399	S. G. Cottonseed Meal	Shaw Cotton Oil Co., Shaw.....
16531	S. G. Cottonseed Meal	Shaw Cotton Oil Co., Shaw.....
SHELBY OIL COMPANY, Shelby, Miss.		
16398	S. G. Cottonseed Meal	Shelby Oil Company, Shelby.....
16530	S. G. Cottonseed Meal	Shelby Oil Company, Shelby.....
SHUBUTA OIL & M'F'G. CO, Shubuta, Miss.		
16446	H. G. Cottonseed Meal	Shubuta Oil & M'f'g. Co., Shubuta ...
16552	H. G. Cottonseed Meal	Shubuta Oil & M'f'g. Co., Shubuta...

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
16405	9.05	6.27	4.95	7.62	6.02	26.65	21.04
16537	9.21	6.03	4.95	7.33	6.02	25.63	21.04
16418	8.44	5.57	4.95	6.77	6.02	23.67	21.04
16053	8.95	7.18	6.18	8.73	7.51	30.52	26.27
16374	10.92	6.89	6.18	8.38	7.51	29.28	26.27
16573	9.60	7.10	6.18	8.63	7.51	30.18	26.27
16404	8.14	6.77	5.00	8.23	6.08	28.77	21.25
16383	6.91	7.20	6.20	8.75	7.54	30.60	26.35
16362	7.21	6.92	4.95	8.41	6.02	29.41	21.04
16544	7.11	7.19	4.95	8.74	6.02	30.56	21.04
16399	7.64	5.78	4.95	7.03	6.02	24.57	21.04
16531	9.28	6.24	4.95	7.59	6.02	26.52	21.04
16398	8.81	6.58	6.00	8.00	7.29	27.97	25.50
16530	10.15	6.42	6.00	7.81	7.29	27.29	25.50
16446	9.09	7.24	6.18	8.80	7.51	30.77	26.27
16552	9.05	7.29	6.18	8.86	7.51	30.98	26.27

TABLE I.—Analyses of Cotton-Seed Meal

Laboratory Number.	Name of Brand and Manufacturer.	Where and from Whom Collected.
	SOUTHERN COTTON OIL CO., Memphis, Tenn.	
15839	H. G. Cottonseed Meal.....	Farmers' Wse. Co., New Albany.....
	SOUTHERN OIL & FERT. CO., Meridian, Miss.	
16337	H. G. Cottonseed Meal.....	Southern Oil & Fert. Co., Meridian....
16448	H. G. Cottonseed Meal.....	Southern Oil & Fert. Co., Meridian....
	SULLIGENT COTTON OIL CO., Sulligent, Ala.	
16568	H. G. Cottonseed Meal.....	Gilmore & May Co., Amory.....
	TENNESSEE COTTON OIL CO., Jackson, Tenn.	
16571	H. G. Cottonseed Meal.....	Phillips-Rinehart Taylor Co., B'ville
16572	H. G. Cottonseed Meal.....	L. L. Brown, Booneville.....
	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	
16376	H. G. Cottonseed Meal.....	Tupelo Oil & Ice Co., Tupelo.....
16569	H. G. Cottonseed Meal.....	Tupelo Oil & Ice Co., Tupelo.....
	VICKSBURG COTTON OIL CO., Vicksburg, Miss.	
16546	H. G. Cottonseed Meal.....	Vicksburg Cotton Oil Co., Vicksburg....
16699	H. G. Cottonseed Meal.....	W. W. Pigford, Lumberton.....
	WESSON COTTON OIL & FERT. COMPANY, Wesson, Miss.	
16350	H. G. Cottonseed Meal.....	Wesson Cotton Oil & Fert Co., Wesson
16424	H. G. Cottonseed Meal.....	Wesson Cotton Oil & Fert. Co., Wesson
	WINONA OIL & M'F'G. COMPANY, Winona, Miss.	
16387	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....
16541	H. G. Cottonseed Meal.....	Winona Oil & M'f'g. Co., Winona.....

Collected by State Chemist, Season 1910-1911.

Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
15839	6.89	6.90	6.18	8.39	7.51	29.33	26.27
16337	7.07	6.79	6.18	8.26	7.51	28.86	26.27
16448	9.03	6.22	6.18	7.56	7.51	26.44	26.27
16568	9.49	6.80	6.58	8.27	8.00	28.90	27.97
16571	10.15	6.04	6.18	7.34	7.51	25.67	26.27
16572	9.93	6.71	6.18	8.16	7.51	28.52	26.27
16376	11.24	6.60	6.60	8.02	8.02	28.05	28.05
16569	9.35	6.86	6.60	8.34	8.02	29.16	28.05
16546	8.24	6.63	6.18	8.03	7.51	28.18	26.27
16699	8.15	6.52	6.18	7.93	7.51	27.71	26.27
16350	7.73	7.11	6.18	8.64	7.51	30.22	26.27
16424	12.98	7.17	6.18	8.72	7.51	30.47	26.27
16387	9.74	7.13	6.18	8.67	7.51	30.30	26.27
16541	10.46	6.79	6.18	8.26	7.51	28.86	26.27

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1910-11.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen (Guaranteed) Per Cent.	Ammonia—equiva- lent of Nitrogen— Found—Per Cent.	Ammonia—equiva- lent of Nitrogen— Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
15557	ABERDEEN MILLING & M'F'G. CO., Aberdeen, Miss. H. G. Cottonseed Meal	15557	9.40	6.91	6.18	8.40	7.51	29.37	26.27
15729	ANGUILLA OIL & GIN COMPANY, Anguilla, Miss. H. G. Cottonseed Meal	15729			6.18		7.51		26.27
15963	BARBER & LEWIS OIL CO., Edwards, Miss. H. G. Cottonseed Meal	15963	7.68	6.62	6.18	8.05	7.51	28.14	26.27
16908	BELZONI OIL WORKS, Belzoni, Miss. S. G. Cottonseed Meal	16908	9.70	6.04	4.95	7.34	6.02	25.67	21.04
15558	BIRMINGHAM OIL COMPANY, Birmingham, Ala. H. G. Cottonseed Meal	15558	9.83	6.30	6.18	7.66	7.51	26.78	26.27
15688	BROO HAVEN COTTON OIL & FERT. CO., Brookhaven, Miss. H. G. Cottonseed Meal	15688	10.38	6.58	6.18	8.00	7.51	27.97	26.27
15559	BUCKEYE COTTON OIL COMPANY, Jackson, Miss. H. G. Cottonseed Meal	15559	8.37	5.64	4.95	6.86	6.02	23.97	21.04
15923	CANTON OIL MILL COMPANY, Canton, Miss. H. G. Cottonseed Meal	15923	9.02	6.74	6.18	8.19	7.51	28.65	26.27
			9.05	6.71	6.18	8.16	7.51	28.52	26.27

15692	H. G. Cottonseed Meal	CENTRAL COTTON OIL COMPANY, Jackson, Miss.	15692	8.55	6.83	6.18	8.30	7.51	29.03	26.27
15565	H. G. Cottonseed Meal	CLAY COUNTY COTTON OIL COMPANY, West Point, Miss.	15565	8.75	6.20	6.18	7.54	7.51	26.35	26.27
16969	H. G. Cottonseed Meal	CRESCENT COTTON OIL COMPANY, Memphis, Tenn.	16969	9.34	6.57	6.18	7.99	7.51	27.92	26.27
15756	H. G. Cottonseed Meal	CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. COMPANY, Crystal Springs, Miss.	15756	8.00	7.27	6.18	8.84	7.51	30.90	26.27
	S. G. Cottonseed Meal	DEESON OIL MILL, Deeson, Miss.				5.50		6.69		23.38
15696	S. G. Cottonseed Meal	DELTA OIL COMPANY, Greenville, Miss.	15696	6.84	6.03	4.95	7.33	6.02	25.63	21.04
15656	H. G. Cottonseed Meal	DeSOTO OIL COMPANY, Greenville, Miss.	15656	7.35	7.20	6.18	8.75	7.51	30.60	26.27
15590	H. G. Cottonseed Meal	DUMAS GROCERY COMPANY, Mobile, Ala.	15590	7.74	6.35	6.18	7.72	7.51	26.99	26.27
15921	H. G. Cottonseed Meal	EAGLE COTTON OIL COMPANY, Meridian, Miss.	15921	10.17	6.60	6.18	8.02	7.51	28.05	26.27
15922	H. G. Cottonseed Meal	EASTMAN OIL MILLS, Jonestown, Miss.	15922	10.21	6.68	6.18	8.12	7.51	28.39	26.27
15695	H. G. Cottonseed Meal	A. H. GEORGE & COMPANY, Meridian, Miss.	15695	7.87	6.14	6.18	7.47	7.51	26.10	26.27
15757	H. G. Cottonseed Meal	GEOGHEGEN & COMPANY, New Orleans, La.	15757	8.80	6.29	6.50	7.65	7.94	26.73	27.64

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1910-1911.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
15658	J. T. GIBBONS, New Orleans, La. H. G. Cottonseed Meal	15658	5.74	6.41	6.18	7.79	7.51	27.24	26.27
15654	GLEN ALLAN OIL MILL, Glen Allan, Miss. H. G. Cottonseed Meal	15654	6.59	6.12	6.18	7.44	7.51	26.01	26.27
15449	B. F. GLOVER & SON COMMISSION CO., New Orleans, La. H. G. Cottonseed Meal	15449	8.57	6.64	6.18	8.07	7.51	28.22	26.27
15450	H. G. Cottonseed Meal	15450	8.93	3.92	3.50	4.77	4.26	16.66	14.88
15730	GRENADA OIL MILL, Grenada, Miss. H. G. Cottonseed Meal	15730	7.77	6.65	6.20	8.09	7.54	28.26	26.35
16581	GULFPORT FERTILIZER COMPANY, Gulfport, Miss. H. G. Primo Cottonseed Meal	16581	9.57	6.78	6.18	8.24	7.51	28.82	26.27
15755	HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss. H. G. Cottonseed Meal	15755	6.06	7.18	6.18	8.73	7.51	30.52	26.27
16580	HOLLANDALE COTTON OIL MILL, Hollandale, Miss. H. G. Cottonseed Meal	16580	10.05	6.51	6.18	7.91	7.51	27.67	26.27
	HOLLYWOOD OIL MILL, Hollywood, Miss. H. G. Cottonseed Meal				6.18		7.51		26.27

15754	H. G. Cottonseed Meal	IMPERIAL COTTON OIL CO., Macon, Miss.	15754	9.17	6.42	6.18	7.81	7.51	27.29	26.27
15691	H. G. Cottonseed Meal	INDEPENDENT OIL & FERTILIZER WORKS, Columbus, Miss.	15691	7.62	7.19	6.18	8.74	7.51	30.56	26.27
15560	S. G. Cottonseed Meal	INDIANOLA COTTON OIL CO., Indianola, Miss.	15560	6.30	6.71	4.95	8.16	6.02	28.52	21.04
15518	H. G. Cottonseed Meal	JACKSON FERTILIZER CO., Jackson, Miss.	15518	6.93	6.52	6.18	7.93	7.51	27.71	26.27
15690	H. G. Cottonseed Meal	JACKSON OIL & REFINING CO., Jackson, Miss.	15690	8.61	6.72	6.18	8.17	7.51	28.56	26.27
15519	Extra H. G. Cottonseed Meal	LAUREL OIL & FERTILIZER CO., Laurel, Miss.	15519	7.96	6.58	6.56	8.00	7.98	27.97	27.88
15520	H. G. Cottonseed Meal		15520	7.81	6.40	6.18	7.78	7.51	27.20	26.27
15686	S. G. Cottonseed Meal	LELAND OIL WORKS, Leland, Miss.	15686	7.99	7.00	4.95	8.51	6.02	29.75	21.04
16970	H. G. Cottonseed Meal	LEXINGTON COTTON OIL CO., Lexington, Miss.	16970	9.71	6.61	6.18	8.04	7.51	28.09	26.27
15752	S. G. Cottonseed Meal		15752	8.83	6.55	4.95	7.96	6.02	27.84	21.04
15924	O. G. Cottonseed Meal	MARY MAC PLANTATION COMPANY, Memphis, Tenn.	15924	10.74	4.16	4.64	5.06	5.64	17.68	19.72
15732	H. G. Cottonseed Meal	GEO. B. MATTHEWS & SONS, New Orleans, La.	15732	7.12	6.79	6.18	8.26	7.51	28.86	26.27
15697	H. G. Cottonseed Meal Extra H. G. Cottonseed Meal	McINNIS & STURGIS, Meridian, Miss.	15697	6.81	6.51	6.18	7.91	7.51 7.98	27.67	26.27 27.88
15992	H. G. Golden Rod Cottonseed Meal	MERIDIAN FERTILIZER FACTORY, Meridian, Miss.	15992	9.73	6.82	6.59	8.29	8.01	28.99	28.01
15993	H. G. Cottonseed Meal		15993	10.53	6.25	6.18	7.60	7.51	26.56	26.27

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1910-1911.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
15555	MINTER CITY OIL WORKS, Minter City, Miss. S. G. Cottonseed Meal	15555	9.20	5.35	4.95	6.50	6.02	22.74	21.04
15599	MISSISSIPPI COTTON OIL CO., Jackson, Miss. H. G. Cottonseed Meal	15599	8.12	6.13	6.18	7.45	7.51	26.05	26.27
15410	MISSISSIPPI FERTILIZER COMPANY, Jackson, Miss. H. G. Cottonseed Meal	15410	7.35	7.40	6.18	9.00	7.51	31.45	26.27
15727	NEWTON OIL & M'F'G. COMPANY, Newton, Miss. H. G. Cottonseed Meal	15727	7.60	7.22	6.18	8.78	7.51	30.69	26.27
15728	J. E. NELSON, Vicksburg, Miss. H. G. Cottonseed Meal	15728	7.76	8.20	6.18	9.97	7.51	34.85	26.27
15698	NORTH MISSISSIPPI OIL MILLS, Holly Springs, Miss. H. G. Cottonseed Meal	15698	6.25	7.24	6.18	8.80	7.51	30.77	26.27
15561	OKOLONA OIL COMPANY, Okolona, Miss. H. G. Cottonseed Meal	15561	12.07	6.21	6.18	7.55	7.51	26.39	26.27
15689	OXFORD OIL MILL CO., Oxford, Miss. H. G. Cottonseed Meal	15689	7.20	6.91	6.18	8.40	7.51	29.37	26.27

15602	PEOPLES COTTON OIL & FIBRE CO., North Carrollton, Miss. S. G. Cottonseed Meal	15602	7.12	6.12	5.40	7.44	6.57	26.01	22.95
15562	PEOPLES OIL MILL & FERT. WORKS, Aberdeen, Miss. H. G. Cottonseed Meal	15562	9.22	6.54	6.18	7.95	7.51	27.80	26.27
15597	PHOENIX COTTON OIL CO., Como, Miss. H. G. Cottonseed Meal	15597	7.88	6.43	6.18	7.82	7.51	27.33	26.27
15847	PLANTERS GIN & OIL CO., Baldwin, Miss. H. G. Cottonseed Meal	15847	5.99	7.48	6.18	9.09	7.51	31.79	26.27
15687	PLANTERS OIL MILL, Tunica, Miss. H. G. Cottonseed Meal	15687	7.99	6.63	6.50	8.03	7.90	28.18	27.63
15598	PLANTERS OIL MILL & GIN CO., Kosciusko, Miss. H. G. Cottonseed Meal	15598	6.74	7.10	6.18	8.63	7.51	30.18	26.27
16102	PLANTERS OIL MILL & M'F'G. CO., Greenwood, Miss. H. G. Cottonseed Meal	16102	9.86	6.22	6.18	7.56	7.51	26.44	26.27
15740	PLANTERS OIL WORKS, Clarksdale, Miss. S. G. Cottonseed Meal	15740	8.80	6.94	5.00	8.44	6.08	29.50	21.25
15596	PONTOTOC COTTON OIL CO., Pontotoc, Miss. H. G. Cottonseed Meal	15596	7.33	7.12	6.18	8.66	7.51	30.26	26.27
15694	PORT GIBSON OIL WORKS, Port Gibson, Miss. S. G. Cottonseed Meal	15694	7.50	6.77	5.00	8.23	6.08	28.77	21.25
15448	PRODUCERS COTTON OIL CO., Yazoo City, Miss. H. G. Cottonseed Meal	15448	8.45	6.00	6.18	7.29	7.51	25.50	26.27
15534	REFUGE COTTON OIL CO., Vicksburg, Miss. H. G. Cottonseed Meal	15534	11.40	6.27	6.18	7.62	7.51	26.65	26.27
15535		15535	11.56	6.03	4.95	7.33	6.02	25.63	21.04

TABLE II.—Analyses of Official Samples of Cottonseed Meal Registered for Sale in the State, with Guarantees for Season 1910-11.

Laboratory Number.	Name of Brand and Address of Manufacturer.	Laboratory Number.	Moisture—Per Cent.	Nitrogen Found Per Cent.	Nitrogen Guaranteed Per Cent.	Ammonia—equivalent of Nitrogen—Found—Per Cent.	Ammonia—equivalent of Nitrogen—Guaranteed—Per Cent.	Value of Nitrogen Found—Per Ton.	Value of Nitrogen Guaranteed—Per Ton.
15693	RICHMOND COTTON OIL CO., Corinth, Miss. H. G. Cottonseed Meal	15693	7.55	7.12	6.18	8.66	7.51	30.26	26.27
15655	ROLLING FORK OIL COMPANY, Rolling Fork, Miss. S. G. Cottonseed Meal	15655	7.25	6.61	5.00	8.04	6.08	28.09	21.25
15919	SARDIS OIL COMPANY, Sardis, Miss. H. G. Cottonseed Meal	15919	7.04	7.17	6.20	8.72	7.54	30.47	26.35
15739	SHELBY OIL COMPANY, Shelby, Miss. S. G. Cottonseed Meal	15739	6.82	6.30	6.00	7.66	7.29	26.78	25.50
15538	SHUBUTA OIL & M'F'G. COMPANY, Shubuta, Miss. H. G. Cottonseed Meal	15538	9.09	7.00	6.18	8.51	7.51	29.75	26.27
15699	SOUTHERN COTTON OIL CO., Memphis, Tenn. H. G. Cottonseed Meal	15699	6.92	6.84	6.18	8.32	7.51	29.07	26.27
16971	H. G. Cottonseed Meal	16971	7.88	6.49	6.59	7.89	8.01	27.58	28.01
15751	SOUTHERN OIL & FERTILIZER CO., Meridian, Miss. H. G. Cottonseed Meal	15751	9.10	6.78	6.18	8.24	7.51	28.82	26.27
15487	STANDARD GUANO & CHEM. M'F'G. CO., New Orleans, La. H. G. Cottonseed Meal	15487	7.83	7.19	6.47	8.74	7.87	30.56	27.50

17031	H. G. Cottonseed Meal	STARKVILLE COTTON OIL CO., Starkville, Miss.	17031	6.41	6.38	6.18	7.76	7.51	27.12	26.27
16101	H. G. Cottonseed Meal	SULLIGENT COTTON OIL CO., Sulligent, Ala.	16101	9.77	6.81	6.58	8.28	8.90	28.94	27.97
16972	H. G. Cottonseed Meal	TATE BROTHERS, Memphis, Tenn.	16972	7.83	6.52	6.18	7.93	7.51	27.71	26.27
15593	H. G. Cottonseed Meal	TENNESSEE COTTON OIL CO., Memphis, Tenn.	15593	8.03	6.24	6.18	7.59	7.51	26.52	26.27
15657	H. G. Cottonseed Meal	TUPELO OIL & ICE COMPANY, Tupelo, Miss.	15657	7.38	6.73	6.60	8.18	8.02	28.60	28.05
15731	H. G. Cottonseed Meal	VICKSBURG COTTON OIL CO., Vicksburg, Miss.	15731	6.96	7.13	6.18	8.67	7.51	30.32	26.27
15563	H. G. Cottonseed Meal	WESSON COTTON OIL & FERTILIZER CO., Wesson, Miss.	15563	8.05	6.94	6.18	8.44	7.51	29.50	26.27
15920	H. G. Cottonseed Meal	WINONA OIL & M'FG. CO., Winona, Miss.	15920	10.18	6.81	6.18	8.28	7.51	28.94	26.27
15593	H. G. Cottonseed Meal	J. LINDSAY WELLS COMPANY, Memphis, Tenn.	15593	8.90	6.37	6.18	7.74	7.51	27.07	26.27
15594	O. G. Cottonseed Meal		15594	10.20	3.19	3.50	3.88	4.26	13.56	14.88

Mississippi Agricultural Experiment Station

Agricultural College, Mississippi

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BULLETIN No. 149.

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INSPECTION AND ANALYSES OF
COMMERCIAL FEEDING STUFFS

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI.

OCTOBER, 1911.

# MISSISSIPPI FERTILIZER AND FEEDING STUFFS CONTROL.



## *INSPECTION AND ANALYSES OF FEEDING STUFFS.*



|                      |                   |
|----------------------|-------------------|
| W. F. HAND.....      | STATE CHEMIST     |
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| MISS MARY GAY .....  | STENOGRAPHER      |

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\* Resigned November 1, 1911.

# INSPECTION AND ANALYSES OF COMMERCIAL FEEDING STUFFS.

Season of 1910-1911.

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**Introduction.**—This bulletin contains analyses of 280 samples of commercial feeding stuffs. These samples were drawn from almost all parts of the state by experienced inspectors. The results are sufficient to emphasize in no uncertain way that wide variations exist in the amounts of nutritive substances contained in the various feeding stuffs to be found in the markets. Every purchaser ought to examine the tabulated analyses with the view of ascertaining the actual composition of feeds sold by various manufacturers and guarantors. This information is essential in the intelligent feeding of animals, and it is not less necessary also in enabling the buyer to select feeds which supply nutrients at the lowest price. In this way also he may avoid those sellers who not infrequently ship products which are found to be deficient when samples of them are submitted to analysis.

The suppression of adulteration is only one of the objects of the system of inspection. The publication of large numbers of analyses and of elementary discussions of the composition, digestibility and use of feeds should stimulate a spirit of inquiry on the part of those who must buy them, that they may not only use them more rationally and in accordance with the best practices, but also that they may purchase the nutrients fat, protein, and carbohydrates more economically. A better understanding of feeds and of feeding will foster the proper kind of competition between the sellers themselves. A price competition instead of one based on price and quality (as shown by analyses, and, in the case of mixed feeds, of the materials used in the preparation of the mixture) is responsible, doubtless, for the waste of much money in the feeding stuffs trade.

**Correlation of price and quality.**—Feeders are almost constantly reminded by agricultural journals and by experiment station bulletins that the actual feeding value, aside from adaptability and palatability of a feeding stuff, must be measured most largely by the amounts of digestible fat, protein, and carbohydrates contained in a given weight, say, in a hundred pounds, or in a ton, it being assumed that the feeds forming the ration are properly proportioned.



**The price per ton is too often the controlling factor in the purchase of feeds.** The price should be considered only after the composition of the feed is known. Mixed feeds especially vary greatly in composition. There should be a corresponding variation in price. The buyer ought to ascertain also the materials out of which these mixtures are made. Careful inquiry will assist them in selecting feeding stuffs and mixed feeds in such a way that inferior products and mixtures will no longer compete in the markets with those of a meritorious character. The so-called cheap mixtures are apt to be dear at any price at which they can be obtained. It happens frequently that mixed feeds of comparatively low grade command as high a price per ton as those containing a larger proportion of actual nutrients. These cases of mistaken judgment will not be avoided altogether until purchasers generally insist upon a careful examination of the composition of feeds offered to them. There is no necessity of paying more for digestible nutrients in one feed or feed mixture than they would cost in another. The price ought to vary with the quality.

The composition, use, digestibility etc., of feeding stuffs in general are discussed in bulletin No. 144.

**Responsibility of sellers.**—The feeding stuffs law has been in effect several years now, and those who sell feeds in this state should know that they will be held responsible for the sale of illegal products. The composition of every feed must be guaranteed to the buyer. The seller residing in this state is responsible for this guaranty. When deficiencies persistently occur, the seller will be prosecuted for the recovery of fines and penalties prescribed by the law. Retailers who buy from persons or firms residing without the state should secure from the sellers some form of legal guarantee that such interstate shipments will comply with every requirement of the Mississippi law. It is the duty of dealers to examine all feeds handled by them to ascertain whether the bags carry both the guaranty tag and the state tax tag. The sale of rice hulls or of any feed containing rice hulls is forbidden.

**Results.**—The table contains the results of the analyses of 280 samples. Some of these analyses show deficiencies which indicate a lack of control over conditions which the best interest of the purchaser cannot permit. In many cases the deficiencies are comparatively small. Shortages in fat occur much more often than deficiencies in protein. It often happens also that a sample will be found deficient in fat while well above the guarantee in protein, but this adjustment of values possesses no legal significance and has its limitations also from the point of view of the feeder. The following short tabular

statement will illustrate how well the feeds represented in the table of analyses have been found to meet the guaranties made for them:

Number of analyses.....280

|                                                                                         | No. of<br>Samples. | Percentage of<br>Analyses in Table. |
|-----------------------------------------------------------------------------------------|--------------------|-------------------------------------|
| Below guarantee in fat .....                                                            | 82                 | 29.28                               |
| Below guarantee in protein .....                                                        | 59                 | 21.07                               |
| Below guarantee in fat to extent of 10% of<br>amount guaranteed .....                   | 43                 | 15.36                               |
| Below guarantee in protein to extent of 10%<br>of amount guaranteed .....               | 5                  | 1.78                                |
| Below guarantee in both fat and protein to<br>extent of 10% of amounts guaranteed ..... | 4                  | 1.43                                |

There are comparatively few instances of excessive amounts of fiber. There are also only a few samples materially deficient in both fat and protein.

**Method of sampling.**—The fairness and efficiency of this system of inspection rest most largely upon the representative character of the samples drawn by inspectors and upon the accuracy of the analytical work. No effort is spared, therefore, to avoid errors which might result in unjust representations in these bulletins.

**Duplicate samples are taken of all mixed feeds.** An improved sampling instrument is used. This will pass through a bag, and the sampler is so constructed that the portion removed by it is enclosed within its stem before the instrument is withdrawn from the bag. Fifteen to twenty bags are examined in making up each sample received from inspectors. Should a sample be found deficient on analysis, the duplicate is immediately analyzed with the view of avoiding as far as possible errors due to improper mixing at the factory. All samples are carefully preserved until the close of the season, and manufacturers or guarantors may secure portions of them for analysis by their private chemists, should they question the accuracy of the analytical work.

**Additional bulletins.**—Additional bulletins will be ready for distribution in a short time. The last of these will contain a complete analysis of the results of the inspection for the entire season.

**Inspection.**—Inspectors are constantly visiting the markets. Samples taken by them will be analyzed as rapidly as the facilities will allow. Feeders or dealers who desire special reports of analyses of any samples taken by inspectors may secure them by request.

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected                             |
|--------------------|----------------------------------------------------------|-----------------------------------------------------------|
|                    | <b>ABBEVILLE RICE MILLING COMPANY,</b><br>Abbeville, La. |                                                           |
| 15766              | Rice Bran .....                                          | Merchants' Grocery Co., Hazlehurst ....<br>Guarantee..... |
|                    | <b>ALFALFA PRODUCTS COMPANY,</b><br>Jackson, Miss.       |                                                           |
| 17166              | Alcorno .....                                            | D. G. Patton, & Co., Jackson .....                        |
| 15767              | Jersey Cream .....                                       | Guarantee* .....                                          |
| 17219              | Uno Horse Feed .....                                     | Alfalfa Products Co., Jackson .....                       |
| 15768              | Uno Horse Feed .....                                     | Guarantee.....                                            |
|                    | <b>AKIN-ERSKINE MILLING CO.,</b><br>Evansville, Ind.     |                                                           |
| 17210              | Wheat Bran .....                                         | Gulfport Grocery Co., Gulfport .....                      |
| 17298              | Wheat Shorts.....                                        | Guarantee.....                                            |
|                    | <b>ALABAMA CORN MILLS CO.,</b><br>Mobile, Ala.           | Broadway Merc. Co., Lucedale .....                        |
| 17300              | Wheat Bran .....                                         | Guarantee.....                                            |
| 17299              | Wheat Middling .....                                     | Croom & Story, Lucedale .....                             |
|                    | <b>ALLEN BAKER COMMISSION COMPANY,</b><br>St. Louis, Mo. | Lucedale Commercial Co., Lucedale ..<br>Guarantee.....    |
| 17310              | Peerless Bran .....                                      | Guarantee.....                                            |
| 17207              | Peerless Bran .....                                      | Gulfport Groc. Co., Gulfport .....                        |
| 17218              | Wheat Middlings .....                                    | Gulfport Groc. Co., Gulfport .....                        |
|                    | <b>AMERICAN MILLING COMPANY,</b><br>Owensboro, Ky.       | Guarantee.....                                            |
| 17137              | Sucrene Dairy Feed .....                                 | R. H. Green & Bro., Jackson .....                         |
| 17308              | Sucrene Dairy Feed .....                                 | Guarantee.....                                            |
| 17309              | Sucrene Mixing Feed .....                                | Carso & Tedesco, Biloxi .....                             |
| 17307              | Sucrene Stock Feed .....                                 | Guarantee.....                                            |
| 17139              | Sucrene Stock Feed .....                                 | Carso & Tedesco, Biloxi .....                             |
|                    |                                                          | C. J. Edwards Co., Vicksburg .....                        |
|                    |                                                          | Guarantee.....                                            |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 15766              | 9.59               | 5.22          | 8.57<br>10.00       | 12.13<br>10.00          | 62.52<br>35.00          | 1.97<br>12.00         |
| 17166              | 11.07              | 5.64          | 3.46                | 13.44                   | 54.34                   | 12.05                 |
| 15767              | 9.97               | 6.89          | 2.64<br>3.80        | 17.44<br>13.00          | 35.90<br>63.00          | 27.16<br>25.00        |
| 17219              | 13.36              | 4.75          | 3.67                | 13.19                   | 56.05                   | 8.98                  |
| 15768              | 10.78              | 4.23          | 3.14<br>4.00        | 12.25<br>14.00          | 57.90<br>52.00          | 11.70<br>12.00        |
| 17210              | 11.71              | 5.67          | 4.10<br>3.50        | 15.00<br>14.00          | 56.12<br>52.00          | 7.40<br>10.00         |
| 17298              | 10.41              | 4.58          | 5.35<br>4.50        | 16.50<br>16.36          | 58.12<br>62.66          | 5.04<br>3.90          |
| 17300              | 9.45               | 8.77          | 4.77<br>4.00        | 13.56<br>14.50          | 53.59<br>50.00          | 9.86<br>9.50          |
| 17299              | 10.64              | 5.65          | 5.00<br>4.00        | 17.69<br>16.00          | 55.50<br>48.00          | 5.52<br>6.42          |
| 17310              | 9.89               | 7.88          | 4.71                | 15.63                   | 53.90                   | 7.99                  |
| 17207              | 12.27              | 6.37          | 4.70<br>3.50        | 15.25<br>15.00          | 53.26<br>53.00          | 8.15<br>9.00          |
| 17218              | 11.97              | 4.83          | 5.03<br>4.25        | 16.75<br>16.00          | 55.99<br>53.75          | 5.43<br>8.00          |
| 17137              | 8.91               | 9.33          | 3.51                | 15.81                   | 51.84                   | 10.60                 |
| 17308              | 9.09               | 10.66         | 4.65<br>3.50        | 16.50<br>16.50          | 49.04<br>46.00          | 10.06<br>12.00        |
| 17309              | 8.60               | 10.24         | 3.72<br>3.50        | 11.44<br>10.00          | 53.68<br>46.00          | 12.92<br>12.00        |
| 17307              | 6.84               | 3.55          | 3.67                | 9.50                    | 66.62                   | 9.82                  |
| 17139              | 8.57               | 4.41          | 2.94<br>3.50        | 9.38<br>10.00           | 62.50<br>50.00          | 12.20<br>12.00        |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                          | Where and from Whom Collected.        |
|--------------------|----------------------------------------------------------|---------------------------------------|
|                    | <b>ARKADELPHIA MILLING COMPANY,</b><br>Arkadelphia, Ark. |                                       |
| 17267              | Bran .....                                               | W. W. Lassiter & Co., Vicksburg ..... |
| 17188              | Bran .....                                               | Lampton Merc. Co., Magnolia .....     |
|                    |                                                          | Guarantee .....                       |
| 17226              | Shorts .....                                             | Taylor-Wills Groc. Co., Jackson ..... |
|                    |                                                          | Guarantee.....                        |
|                    | <b>AURORA MILLING COMPANY,</b><br>Aurora, Mo.            |                                       |
| 17155              | Aurora Mixed Feed .....                                  | W. H. Pritchardt & Co., Natchez ..... |
|                    |                                                          | Guarantee.....                        |
|                    | <b>BALLARD &amp; BALLARD COMPANY,</b><br>Louisville, Ky. |                                       |
| 17163              | Ballard's Bran .....                                     | Ballard & Ballard Co., Jackson .....  |
| 15769              | Ballard's Bran .....                                     | Ballard & Ballard Co., Jackson .....  |
|                    |                                                          | Guarantee.....                        |
| 17195              | Ballard's Shipstuff .....                                | Columbia Grocery Co., Columbia .....  |
|                    |                                                          | Guarantee.....                        |
|                    | <b>C. BECKER MILLING COMPANY,</b><br>Red Bud, Ill.       |                                       |
| 17208              | Wheat Bran .....                                         | Gulfport Groc. Co., Gulfport, .....   |
|                    |                                                          | Guarantee.....                        |
| 17327              | Wheat Shorts.....                                        | The Fair Co., Louisville .....        |
|                    |                                                          | Guarantee.....                        |
|                    | <b>BILOXI MILLING COMPANY,</b><br>Biloxi, Miss.          |                                       |
| 17305              | B. M. C. Cow Feed .....                                  | Biloxi Milling Co., Biloxi .....      |
|                    |                                                          | Guarantee.....                        |
|                    | <b>BROWDER MILLING COMPANY,</b><br>Fulton, Ky.           |                                       |
| 17240              | Mixed Feed .....                                         | W. F. Funchess & Co., Osyka.....      |
| 15770              | Mixed Feed .....                                         | P. B. Furr, Oxford .....              |
| 15771              | Mixed Feed .....                                         | Lotterhos & Huber Co., Crystal Sp'gs. |
| 15772              | Mixed Feed .....                                         | Merchants' Groc. Co., Brookhaven .... |
|                    |                                                          | Gaurantee.....                        |
|                    | <b>W. P. BROWN &amp; COMPANY,</b><br>Memphis, Tenn.      |                                       |
| 17340              | Mixed Bran .....                                         | Farmers Warehouse Co., Iuka .....     |
|                    |                                                          | Guarantee* .....                      |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17267              | 8.22               | 8.52          | 4.49                | 16.31                   | 53.46                   | 9.00                  |
| 17188              | 9.74               | 6.02          | 4.76                | 14.81                   | 57.64                   | 7.03                  |
|                    |                    |               | 3.50                | 12.00                   | 50.00                   | 12.00                 |
| 17226              | 11.02              | 5.97          | 5.73                | 16.50                   | 53.75                   | 7.03                  |
|                    |                    |               | 3.50                | 12.00                   | 50.00                   | 12.00                 |
| 17155              | 10.71              | 4.39          | 4.30                | 16.50                   | 57.50                   | 6.60                  |
|                    |                    |               | 3.50                | 16.00                   | 53.00                   | 10.00                 |
| 17163              | 10.44              | 6.51          | 4.49                | 15.94                   | 53.71                   | 8.91                  |
| 15769              | 10.53              | 6.82          | 3.98                | 14.94                   | 53.92                   | 9.81                  |
|                    |                    |               | 4.10                | 14.44                   | 50.00                   | 9.00                  |
| 17195              | 11.30              | 4.19          | 4.40                | 16.44                   | 58.40                   | 5.27                  |
|                    |                    |               | 3.75                | 15.69                   | 55.00                   | 6.87                  |
| 17208              | 11.78              | 6.15          | 4.01                | 15.13                   | 54.95                   | 7.98                  |
|                    |                    |               | 3.58                | 14.50                   | 52.00                   | 10.00                 |
| 17327              | 7.98               | 4.76          | 4.82                | 17.06                   | 61.05                   | 4.33                  |
|                    |                    |               | 4.20                | 15.50                   | 60.30                   | 3.70                  |
| 17305              | 11.00              | 7.83          | 2.74                | 13.00                   | 60.89                   | 4.54                  |
|                    |                    |               | 5.00                | 10.00                   | 62.55                   | 10.00                 |
| 17240              | 11.99              | 4.70          | 4.53                | 14.31                   | 58.57                   | 5.90                  |
| 15770              | 10.59              | 5.77          | 4.46                | 14.56                   | 58.04                   | 6.58                  |
| 15771              | 10.75              | 6.70          | 4.80                | 14.31                   | 57.44                   | 6.00                  |
| 15772              | 10.51              | 4.90          | 4.48                | 14.31                   | 59.64                   | 6.16                  |
|                    |                    |               | 4.25                | 15.00                   | 54.00                   | 9.00                  |
| 17340              | 4.51               | 5.62          | 5.60                | 14.69                   | 63.67                   | 5.91                  |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.        |
|--------------------|--------------------------------------------------------------|---------------------------------------|
|                    | <b>CAIRO MILLING COMPANY,</b><br>Cairo, Ill.                 |                                       |
| 17156              | Pine Leaf Middlings .....                                    | Merchants Groc. Co., Brookhaven ..    |
| 17178              | Pine Leaf Middlings .....                                    | J. L. Wells Grocery Co., Meridian ... |
| 17295              | Pine Leaf Middlings .....                                    | Ovett Merc. Co., Ovett .....          |
| 17324              | Pine Leaf Middlings .....                                    | J. J. Prince, Shuqualak .....         |
| 17342              | Pine Leaf Middlings .....                                    | L. L. Brown, Booneville .....         |
|                    |                                                              | Guarantee.....                        |
| 17157              | Purity Bran .....                                            | Merchants Groc. Co., Brookhaven ..    |
| 17181              | Purity Bran .....                                            | Harris & Co., Meridian.....           |
| 17257              | Purity Bran .....                                            | Miss. Feed Co., Greenville .....      |
| 17277              | Purity Bran .....                                            | McInnis & Sturgis, Meridian .....     |
| 17282              | Purity Bran .....                                            | Tom Lyle Groc. Co., Meridian .....    |
| 17296              | Purity Bran .....                                            | Ovett Merc. Co., Ovett .....          |
| 17343              | Purity Bran .....                                            | L. L. Brown, Booneville .....         |
|                    |                                                              | Guarantee.....                        |
| *17297             | Premium XXXX Horse, Mule<br>& Cow Feed .....                 | Ovett Merc. Co., Ovett .....          |
|                    |                                                              | Guarantee*.....                       |
|                    | <b>CAPE COUNTY MILLING COMPANY,</b><br>Jackson, Mo.          |                                       |
| 17345              | Shorts .....                                                 | C. M. Elder, New Albany .....         |
|                    |                                                              | Guarantee.....                        |
|                    | <b>W. F. CHAMBERLAIN FEED<br/>COMPANY,</b><br>St. Louis, Mo. |                                       |
| *17338             | Chamin's Perfect Chick Feed ....                             | L. L. Brown, Booneville .....         |
|                    |                                                              | Guarantee* .....                      |
|                    | <b>CHAPIN &amp; COMPANY,</b><br>St. Louis, Mo.               |                                       |
| 15773              | Wheat Middlings .....                                        | R. H. Green & Bro., Jackson .....     |
|                    |                                                              | Guarantee.....                        |
|                    | <b>CLEVELAND BROTHERS,</b><br>Mobile, Ala.                   |                                       |
| 17302              | Wheat Bran .....                                             | DeJean Mitchell, Pascagoula.....      |
|                    |                                                              | Guarantee.....                        |
| 17301              | Wheat Shorts.....                                            | DeJean Mitchell, Pascagoula.....      |
|                    |                                                              | Guarantee.....                        |
|                    | <b>COLUMBIA STAR MILLING<br/>COMPANY,</b><br>Columbia, Ill.  |                                       |
| 17206              | Wheat Middlings .....                                        | Gulfport Groc. Co., Gulfport.....     |
| 15774              | Wheat Middlings .....                                        | Davis & Chandler, West Point .....    |
|                    |                                                              | Guarantee.....                        |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17156              | 10.11              | 3.74          | 4.00                | 16.69                   | 62.01                   | 3.45                  |
| 17178              | 10.88              | 3.45          | 4.22                | 16.38                   | 61.28                   | 3.79                  |
| 17295              | 9.57               | 3.62          | 5.01                | 16.63                   | 61.15                   | 4.02                  |
| 17324              | 7.24               | 3.58          | 4.73                | 15.88                   | 65.09                   | 3.48                  |
| 17342              | 5.14               | 3.95          | 4.67                | 15.94                   | 66.68                   | 3.62                  |
|                    |                    |               | 4.20                | 15.75                   | 57.95                   | 6.10                  |
| 17157              | 9.31               | 5.73          | 4.00                | 15.75                   | 57.17                   | 8.04                  |
| 17181              | 10.59              | 5.16          | 4.02                | 16.00                   | 57.29                   | 6.94                  |
| 17257              | 10.69              | 5.94          | 4.40                | 14.63                   | 56.24                   | 8.10                  |
| 17277              | 9.09               | 6.50          | 4.32                | 15.19                   | 57.27                   | 7.63                  |
| 17282              | 8.86               | 5.61          | 4.47                | 16.56                   | 57.01                   | 7.49                  |
| 17296              | 9.80               | 6.12          | 5.00                | 15.06                   | 56.14                   | 7.88                  |
| 17343              | 5.16               | 7.02          | 4.71                | 14.81                   | 60.50                   | 7.80                  |
|                    |                    |               | 4.00                | 13.40                   | 54.00                   | 10.30                 |
| 17297              | 9.30               | 4.78          | 3.20                | 9.69                    | 61.12                   | 11.91                 |
| 17345              | 9.37               | 4.28          | 4.62                | 15.69                   | 62.62                   | 3.42                  |
|                    |                    |               | 3.80                | 16.12                   | 62.87                   | 3.53                  |
| 17338              | 4.68               | 15.42         | 2.75                | 9.19                    | 65.36                   | 2.60                  |
| 15773              | 10.52              | 5.84          | 3.78                | 17.00                   | 60.06                   | 2.80                  |
|                    |                    |               | 5.00                | 14.00                   | 40.00                   | 10.00                 |
| 17302              | 8.46               | 7.10          | 4.96                | 16.00                   | 55.10                   | 8.38                  |
|                    |                    |               | 3.50                | 12.00                   | 50.00                   | 10.50                 |
| 17301              | 9.95               | 4.52          | 5.68                | 17.56                   | 57.87                   | 4.42                  |
|                    |                    |               | 3.50                | 12.00                   | 50.00                   | 10.50                 |
| 17206              | 11.29              | 5.16          | 4.66                | 16.13                   | 57.96                   | 4.80                  |
| 15774              | 10.14              | 6.63          | 4.23                | 16.31                   | 57.14                   | 5.55                  |
|                    |                    |               | 5.02                | 15.26                   | 60.47                   | 3.75                  |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                  | Where and from Whom Collected.                                   |
|--------------------|------------------------------------------------------------------|------------------------------------------------------------------|
|                    | <b>CONCORDIA MILL &amp; ELEVATOR COMPANY,<br/>Concordia, Mo.</b> |                                                                  |
| 15775              | Wheat Bran .....                                                 | Tom Lyle Groc. Co., Meridian .....<br>Guarantee.....             |
|                    | <b>CORNO MILLS COMPANY,<br/>St. Louis, Mo.</b>                   |                                                                  |
| 17244              | Creamo Dairy Feed .....                                          | Greenwood Groc. Co., Greenwood .....<br>Guarantee.....           |
| 17127              | Corno Hen Feed .....                                             | The Goyer Co., Greenville .....                                  |
| 17171              | Corno Hen Feed .....                                             | The Hall Co., Laurel .....                                       |
| 17250              | Corno Hen Feed .....                                             | The Goyer Co., Greenville .....<br>Guarantee.....                |
| 15779              | Corno Horse & Mule Feed .....                                    | A. J. Lyons & Co., Meridian .....                                |
| 15778              | Corno Horse & Mule Feed .....                                    | Merchants Grocery Co., Hazlehurst ...                            |
| 15777              | Corno Horse & Mule Feed .....                                    | Greenwood Grocery Co., Greenwood ...                             |
| 15776              | Corno Horse & Mule Feed .....                                    | Greenwood Grocery Co., Greenwood...                              |
| 17126              | Corno Horse & Mule Feed .....                                    | The Goyer Co., Greenville .....                                  |
| 17153              | Corno Horse & Mule Feed .....                                    | Postlethwaite, Stewart Co., Natchez ..                           |
| 17170              | Corno Horse & Mule Feed .....                                    | The Hall Co., Laurel .....                                       |
| 17224              | Corno Horse & Mule Feed .....                                    | Hannah Distributing Co., Jackson .....                           |
| 17243              | Corno Horse & Mule Feed .....                                    | The Greenwood Gro. Co., Greenwood ..                             |
| 17253              | Corno Horse & Mule Feed .....                                    | The Goyer Co., Greenville .....                                  |
| 17329              | Corno Horse & Mule Feed .....                                    | C. W. Bacon, Vaiden .....<br>Guarantee.....                      |
|                    | <b>C. A. DAMMANN &amp; COMPANY,<br/>Memphis, Tenn.</b>           |                                                                  |
| 17344              | Aunt Patsy's Poultry Feed .....                                  | L. L. Brown, Booneville .....<br>Guarantee.....                  |
|                    | <b>DAHNIKE-WALKER MILLING COMPANY,<br/>Union City, Tenn.</b>     |                                                                  |
| 17179              | Wheat Bran .....                                                 | Tutt-Millspaugh Grain Co., Meridian...                           |
| 17177              | Wheat Bran .....                                                 | J. L. Wells Grocery Co., Meridia )                               |
| 15552              | Wheat Bran .....                                                 | A. & M. College, Dairy Department,<br>Agricultural College ..... |
|                    |                                                                  | Guarantee.....                                                   |
| 17337              | Wheat Shorts.....                                                | L. L. Brown, Booneville .....<br>Guarantee.....                  |
|                    | <b>DAVIS &amp; ANDREWS COMPANY,<br/>Memphis, Tenn.</b>           |                                                                  |
| 15780              | Wheat Bran .....                                                 | Greenwood Groc. Co., Greenwood .....<br>Guarantee.....           |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 15775              | 10.80              | 9.41          | 4.04<br>3.50        | 14.75<br>14.00          | 51.49<br>55.00          | 9.51<br>10.00         |
| 17244              | 9.38               | 6.54          | 4.48<br>5.00        | 17.75<br>14.50          | 44.75<br>45.00          | 17.10<br>19.50        |
| 17127              | 11.75              | 1.81          | 3.03                | 10.50                   | 70.09                   | 2.82                  |
| 17171              | 11.44              | 1.57          | 3.33                | 11.13                   | 69.87                   | 2.66                  |
| 17250              | 11.05              | 1.96          | 3.14<br>3.50        | 10.06<br>10.00          | 71.55<br>68.00          | 2.24<br>5.00          |
| 15779              | 10.90              | 5.10          | 3.01                | 9.81                    | 60.37                   | 10.81                 |
| 15778              | 9.88               | 4.10          | 3.27                | 9.88                    | 60.09                   | 12.78                 |
| 15777              | 10.56              | 4.25          | 2.98                | 9.88                    | 60.44                   | 11.89                 |
| 15776              | 9.92               | 3.72          | 3.22                | 9.63                    | 61.27                   | 12.24                 |
| 17126              | 9.76               | 3.86          | 3.25                | 10.25                   | 61.46                   | 11.42                 |
| 17153              | 9.19               | 4.39          | 3.31                | 12.25                   | 60.55                   | 10.31                 |
| 17170              | 10.65              | 3.42          | 3.64                | 10.31                   | 62.62                   | 9.36                  |
| 17224              | 10.89              | 4.32          | 3.71                | 10.81                   | 60.08                   | 10.19                 |
| 17243              | 10.60              | 4.10          | 3.24                | 9.81                    | 61.90                   | 10.35                 |
| 17253              | 11.42              | 3.28          | 3.94                | 9.44                    | 62.08                   | 9.84                  |
| 17329              | 7.33               | 4.10          | 3.86<br>3.50        | 10.94<br>10.00          | 64.80<br>58.50          | 8.97<br>12.00         |
| 17344              | 7.26               | 12.07         | 4.94<br>5.44        | 15.31<br>17.09          | 53.37<br>54.22          | 7.05<br>7.28          |
| 17179              | 10.88              | 5.04          | 4.26                | 11.88                   | 59.78                   | 8.16                  |
| 17177              | 10.32              | 5.05          | 4.57                | 12.25                   | 59.44                   | 8.37                  |
| 15552              | 8.75               | 6.18          | 5.27<br>3.95        | 15.94<br>14.00          | 56.24<br>55.00          | 7.62<br>10.50         |
| 17337              | 6.08               | 4.60          | 4.59<br>4.85        | 15.00<br>13.75          | 66.14<br>62.00          | 3.59<br>7.50          |
| 15780              | 9.28               | 5.99          | 4.16<br>3.50        | 15.56<br>10.00          | 57.24<br>54.00          | 7.77<br>10.50         |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                        | Where and from Whom Collected.        |
|--------------------|--------------------------------------------------------|---------------------------------------|
| 17330              | Wheat Shorts.....                                      | Gilmore, Puckett Groc. Co., Amory..   |
| 15781              | Wheat Shorts.....                                      | W. L. Watkins & Co., Aberdeen ....    |
|                    |                                                        | Guarantee.....                        |
|                    | <b>DIXIE GRAIN COMPANY,</b><br>Mobile, Ala.            |                                       |
| *17303             | Wheat Bran .....                                       | J. F. Krebbs, Moss Point.....         |
|                    |                                                        | Guarantee* .....                      |
|                    | <b>DOMESTIC FLOUR MILLING CO.,</b><br>Kansas City, Mo. |                                       |
| 17168              | Wheat Bran .....                                       | Merchants Groc. Co., Hattiesburg .... |
| 17142              | Wheat Bran .....                                       | Sol. Fried, Vicksburg .....           |
|                    |                                                        | Guarantee.....                        |
| 17182              | Wheat Middlings .....                                  | Harris & Co., Meridian.....           |
| 17283              | Wheat Middlings .....                                  | Tom Lyle Groc. Co., Meridian .....    |
| 17335              | Wheat Middlings .....                                  | J. J. Rogers & Son, Tupelo .....      |
| 17143              | Wheat Middlings .....                                  | Sol. Fried, Vicksburg .....           |
|                    |                                                        | Guarantee.....                        |
|                    | <b>DUNLAP MILLING COMPANY,</b><br>Clarksville, Tenn.   |                                       |
| 17332              | Wheat Bran .....                                       | Gilmore May Co., Amory.....           |
|                    |                                                        | Guarantee.....                        |
|                    | <b>J. B. EDGAR GRAIN COMPANY,</b><br>Memphis, Tenn.    |                                       |
| 17312              | Ceralfa Stock Feed .....                               | Gulfport Feed Store, Gulfport .....   |
| 17291              | Ceralfa Stock Feed .....                               | J. C. McClinton, Newton.....          |
| 17242              | Ceralfa Stock Feed .....                               | The Barrett Groc. Co., Lexington .... |
| 15782              | Ceralfa Stock Feed .....                               | J. C. McClinton, Newton .....         |
|                    |                                                        | Guarantee.....                        |
| 17264              | Manna Hen Feed .....                                   | J. B. Ray, Rosedale .....             |
|                    |                                                        | Guarantee.....                        |
|                    | <b>EGGERS MILLING COMPANY,</b><br>Herman, Mo.          |                                       |
| 17275              | Bran .....                                             | A. J. Lewis, Edwards .....            |
|                    |                                                        | Guarantee.....                        |
|                    | <b>EISENMAYER MILLING COMPANY,</b><br>Springfield, Mo. |                                       |
| 17331              | Shorts .....                                           | Gilmore, May Co., Amory .....         |
|                    |                                                        | Guarantee.....                        |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17330              | 5.80               | 5.23          | 5.55                | 16.69                   | 61.15                   | 5.58                  |
| 15781              | 9.74               | 6.10          | 5.06<br>3.50        | 18.63<br>10.00          | 54.30<br>54.00          | 6.17<br>10.50         |
| 17303              | 8.95               | 7.34          | 4.98                | 15.00                   | 55.00                   | 8.73                  |
| 17168              | 10.74              | 6.83          | 4.49                | 15.88                   | 54.00                   | 8.06                  |
| 17142              | 10.27              | 7.12          | 4.21<br>4.00        | 14.63<br>14.50          | 53.89<br>56.00          | 9.88<br>10.00         |
| 17182              | 10.42              | 4.54          | 5.04                | 18.50                   | 56.64                   | 4.86                  |
| 17283              | 8.58               | 4.76          | 5.14                | 16.75                   | 60.19                   | 4.58                  |
| 17335              | 5.33               | 5.40          | 5.55                | 18.00                   | 59.96                   | 5.76                  |
| 17143              | 10.44              | 4.86          | 5.70<br>4.00        | 17.94<br>15.00          | 56.30<br>56.00          | 4.76<br>7.00          |
| 17332              | 5.86               | 6.80          | 4.83<br>4.00        | 14.56<br>14.00          | 59.25<br>55.00          | 8.70<br>10.00         |
| 17312              | 8.72               | 7.26          | 4.02                | 12.38                   | 57.38                   | 10.24                 |
| 17291              | 8.95               | 6.77          | 4.46                | 13.06                   | 55.56                   | 11.20                 |
| 17242              | 10.58              | 6.55          | 3.78                | 12.31                   | 57.16                   | 9.62                  |
| 15782              | 10.67              | 6.28          | 3.58<br>4.00        | 11.31<br>13.00          | 58.80<br>55.00          | 9.36<br>11.50         |
| 17264              | 11.54              | 2.06          | 4.32<br>3.50        | 11.06<br>10.00          | 68.16<br>60.00          | 2.92<br>5.00          |
| 17275              | 8.60               | 5.92          | 4.26<br>4.50        | 15.56<br>15.00          | 56.90<br>54.00          | 8.76<br>9.25          |
| 17331              | 6.44               | 3.06          | 5.09<br>4.50        | 16.50<br>15.75          | 67.49<br>60.00          | 1.42<br>6.00          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                                 | Where and from Whom Collected.       |
|--------------------|---------------------------------------------------------------------------------|--------------------------------------|
|                    | <b>FREEBURG MILLING COMPANY,</b><br>Freeburg, Ill.                              |                                      |
| 17321              | Wheat Bran .....                                                                | Foote-Patrick Co., Laurel .....      |
|                    |                                                                                 | Guarantee.....                       |
| 17274              | Wheat Middlings .....                                                           | Beaman & Co., Forest .....           |
|                    |                                                                                 | Guarantee.....                       |
|                    | <b>A. H. GEORGE &amp; COMPANY,</b><br>Meridian, Miss.                           |                                      |
| 17288              | George's Mixed Rice Shorts .....                                                | Winner, Klein & Co., Meridian .....  |
|                    |                                                                                 | Guarantee.....                       |
| 17326              | Rice Polish .....                                                               | The Conner-Vaughn Co., Columbia ..   |
|                    |                                                                                 | Guarantee.....                       |
| 15784              | George's Horse & Mule Feed.....                                                 | A. H. George & Co., Meridian.....    |
|                    |                                                                                 | Guarantee.....                       |
| 15783              | George's Ox Feed .....                                                          | A. H. George & Co., Meridian.....    |
| 17194              | George's Ox Feed .....                                                          | The Conner-Vaughn Co., Columbia ..   |
|                    |                                                                                 | Guarantee.....                       |
|                    | <b>J. T. GIBBONS,</b><br>New Orleans, La.                                       |                                      |
| *17319             | Best O Feed .....                                                               | Hicks Mercantile Co., Laurel .....   |
|                    |                                                                                 | Guarantee* .....                     |
|                    | <b>B. F. GLOVER &amp; SON</b><br><b>COMMISSION COMPANY,</b><br>New Orleans, La. |                                      |
| 17192              | Wheat Bran .....                                                                | Conner-Vaughn Co., Columbia .....    |
|                    |                                                                                 | Guarantee.....                       |
| 17191              | Rice Polish .....                                                               | Conner-Vaughn Co., Columbia .....    |
| 17325              | Rice Polish .....                                                               | The Lampton Co., Columbia .....      |
|                    |                                                                                 | Guarantee.....                       |
|                    | <b>GREAT WESTERN CEREAL CO.,</b><br>Chicago, Ill.                               |                                      |
| 15785              | Boss Feed .....                                                                 | Merchants Groc., Co., Brookhaven ..  |
|                    |                                                                                 | Guarantee.....                       |
| 17162              | Daisy Horse Feed .....                                                          | R. H. Green & Bro., Jackson .....    |
|                    |                                                                                 | Guarantee.....                       |
| 17216              | Daisy Scratch Feed .....                                                        | D. W. Wilkinson & Bro., Jackson .... |
|                    |                                                                                 | Guarantee*.....                      |
| 15786              | Grainfalfa .....                                                                | Merchants Groc. Co., Brookhaven ..   |
|                    |                                                                                 | Guarantee.....                       |
| 17161              | Maizefalfa .....                                                                | R. H. Green & Bro., Jackson .....    |
|                    |                                                                                 | Guarantee.....                       |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17321              | 9.37               | 8.16          | 3.75<br>3.50        | 15.56<br>14.00          | 55.22<br>54.00          | 7.94<br>9.50          |
| 17274              | 10.78              | 2.71          | 4.31<br>3.50        | 15.38<br>13.50          | 64.57<br>55.00          | 2.25<br>5.00          |
| 17288              | 7.54               | 5.55          | 9.86<br>5.00        | 11.88<br>10.00          | 61.17<br>50.00          | 4.00<br>6.50          |
| 17326              | 5.97               | 5.79          | 9.64<br>5.00        | 11.19<br>10.00          | 66.11<br>50.00          | 1.30<br>6.50          |
| 15784              | 8.92               | 5.10          | 5.58<br>4.00        | 10.00<br>12.00          | 60.83<br>60.00          | 9.57<br>4.53          |
| 15783              | 9.69               | 3.42          | 3.31                | 8.00                    | 39.37                   | 36.21                 |
| 17194              | 10.40              | 3.85          | 3.56<br>4.00        | 10.38<br>11.00          | 42.87<br>38.00          | 28.94<br>40.00        |
| 17319              | 8.14               | 8.49          | 7.00                | 11.44                   | 53.35                   | 11.58                 |
| 17192              | 11.83              | 7.80          | 4.75<br>3.58        | 15.25<br>14.85          | 52.32<br>54.60          | 8.05<br>10.00         |
| 17191              | 10.30              | 4.73          | 10.18               | 11.75                   | 61.47                   | 1.57                  |
| 17325              | 6.46               | 5.13          | 11.33<br>10.17      | 11.63<br>10.53          | 64.08<br>62.40          | 1.37<br>1.20          |
| 15785              | 8.18               | 3.73          | 4.50<br>4.00        | 9.88<br>9.50            | 65.51<br>60.00          | 8.20<br>10.00         |
| 17162              | 9.34               | 7.19          | 3.05<br>3.50        | 17.13<br>12.00          | 50.97<br>50.00          | 12.32<br>12.00        |
| 17216              | 12.95              | 1.73          | 3.15                | 10.50                   | 69.64                   | 2.03                  |
| 15786              | 9.68               | 3.20          | 3.33<br>4.00        | 10.06<br>10.00          | 65.37<br>60.00          | 8.36<br>11.00         |
| 17161              | 10.11              | 5.15          | 3.11<br>4.00        | 10.88<br>10.00          | 60.32<br>60.00          | 10.43<br>11.00        |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                      | Where and from Whom Collected.            |
|--------------------|------------------------------------------------------|-------------------------------------------|
| 15787              | Sterling Chick Feed .....                            | Merchants Groc. Co., Brookhaven .....     |
|                    |                                                      | Guarantee.....                            |
| 15789              | Sterling Scratch Feed.....                           | Merchants Groc. Co., Hattiesburg .....    |
| 15788              | Sterling Scratch Feed .....                          | Grenada Grocery Co., Grenada .....        |
| 17167              | Sterling Scratch Feed .....                          | Taylor-Wills Groc. Co., Jackson.....      |
|                    |                                                      | Guarantee.....                            |
|                    | <b>GREAT WESTERN FEED COMPANY,</b><br>St. Louis, Mo. |                                           |
| 15790              | Purity Horse & Cattle Feed .....                     | Chas. Edler Grocery Co., Brookhaven ..... |
|                    |                                                      | Guarantee.....                            |
|                    | <b>GULFPORT GROCERY COMPANY,</b><br>Gulfport, Miss.  |                                           |
| 17304              | Big Bucket Cow Feed .....                            | Biloxi Milling Co., Biloxi .....          |
| 17233              | Big Bucket Cow Feed .....                            | Hattiesburg Groc. Co., Hattiesburg .....  |
|                    |                                                      | Guarantee.....                            |
| 17306              | Mile Post Feed .....                                 | Northern Feed Store, Biloxi .....         |
| 17318              | Mile Post Feed .....                                 | Kennedy & Co., Wiggins .....              |
| 17211              | Mile Post Feed .....                                 | Gulfport Groc. Co., Gulfport .....        |
| 17199              | Mile Post Feed .....                                 | Biloxi Milling Co., Biloxi .....          |
| 17189              | Mile Post Feed .....                                 | W. M. Biglane, Collins .....              |
|                    |                                                      | Guarantee.....                            |
|                    | <b>H. L. HALLIDAY MILLING CO.,</b><br>Cairo, Ill.    |                                           |
| 15791              | Wheat Bran .....                                     | Capital Grocery Co., Jackson .....        |
|                    |                                                      | Guarantee.....                            |
| 17293              | Wheat Middlings .....                                | Philadelphia Merc. Co., Philadelphia ..   |
|                    |                                                      | Guarantee.....                            |
|                    | <b>HANNAH DISTRIBUTING CO.,</b><br>Jackson, Miss.    |                                           |
| 17225              | Wheat Bran .....                                     | Hannah Distributing Co., Jackson .....    |
| 17236              | Wheat Bran .....                                     | J. K. Dunn, McComb .....                  |
| 17241              | Wheat Bran .....                                     | Fernwood Lumber Co., Fernwood .....       |
| 17270              | Wheat Bran .....                                     | Gaddis, McLaurin & Greaves, Clinton ..... |
|                    |                                                      | Guarantee.....                            |
| 17164              | Wheat Shorts.....                                    | Hannah Distributing Co., Jackson .....    |
| 17272              | Wheat Shorts.....                                    | H. N. Stuart & Sons, Morton .....         |
|                    |                                                      | Guarantee.....                            |
| 15792              | Mixed Feed .....                                     | Hannah Distributing Co., Jackson .....    |
|                    |                                                      | Guarantee.....                            |
| 15793              | Rice Polish .....                                    | Hannah Distributing Co., Jackson .....    |
| 17165              | Rice Polish .....                                    | Hannah Distributing Co., Jackson .....    |
|                    |                                                      | Guarantee.....                            |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 15787              | 10.21              | 1.60          | 2.84<br>3.50        | 10.50<br>10.00          | 72.98<br>65.00          | 1.87<br>4.00          |
| 15789              | 11.52              | 2.68          | 2.90                | 10.13                   | 70.39                   | 2.38                  |
| 15788              | 11.11              | 1.66          | 3.23                | 9.94                    | 71.61                   | 2.45                  |
| 17167              | 11.02              | 1.53          | 3.41<br>3.50        | 10.69<br>10.00          | 71.24<br>65.00          | 2.11<br>4.00          |
| 15790              | 11.46              | 4.07          | 2.94<br>4.00        | 10.69<br>11.50          | 58.47<br>55.00          | 12.37<br>10.00        |
| 17304              | 7.87               | 5.52          | 4.49                | 17.31                   | 48.35                   | 16.46                 |
| 17233              | 11.38              | 6.26          | 3.80<br>3.50        | 17.69<br>10.00          | 42.62<br>45.00          | 18.25<br>25.00        |
| 17306              | 9.87               | 3.86          | 3.50                | 11.19                   | 63.22                   | 8.36                  |
| 17318              | 8.65               | 4.62          | 3.77                | 11.56                   | 60.98                   | 10.42                 |
| 17211              | 13.21              | 5.12          | 2.49                | 12.00                   | 57.82                   | 9.36                  |
| 17199              | 12.02              | 6.15          | 2.98                | 11.69                   | 57.12                   | 10.04                 |
| 17189              | 9.74               | 3.92          | 3.38<br>3.50        | 11.19<br>10.00          | 63.62<br>57.50          | 8.15<br>12.00         |
| 15791              | 11.22              | 5.35          | 4.44<br>4.00        | 14.56<br>14.00          | 56.69<br>55.00          | 7.74<br>8.50          |
| 17293              | 10.87              | 1.46          | 3.09<br>3.50        | 13.56<br>16.00          | 70.12<br>65.00          | .90<br>1.50           |
| 17225              | 11.57              | 5.17          | 5.13                | 15.38                   | 56.11                   | 6.64                  |
| 17236              | 11.72              | 5.51          | 4.66                | 14.69                   | 56.72                   | 6.70                  |
| 17241              | 11.70              | 5.19          | 4.47                | 14.88                   | 57.01                   | 6.75                  |
| 17270              | 8.57               | 6.54          | 5.20<br>3.50        | 14.94<br>12.00          | 57.27<br>54.00          | 7.48<br>9.00          |
| 17164              | 10.11              | 5.29          | 5.18                | 17.50                   | 55.80                   | 6.12                  |
| 17272              | 8.72               | 4.08          | 5.04<br>3.50        | 17.00<br>12.00          | 60.38<br>54.00          | 4.78<br>8.50          |
| 15792              | 11.17              | 5.35          | 4.02<br>3.50        | 14.69<br>10.00          | 57.31<br>55.00          | 7.46<br>12.00         |
| 15793              | 10.15              | 4.72          | 7.92                | 11.69                   | 64.64                   | .88                   |
| 17165              | 10.55              | 5.90          | 9.82<br>5.50        | 11.13<br>10.00          | 61.66<br>50.00          | .94<br>12.00          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                          | Where and from Whom Collected.            |
|--------------------|--------------------------------------------------------------------------|-------------------------------------------|
|                    | <b>HARRIS &amp; COMPANY,</b><br>Meridian, Miss.                          |                                           |
| 15794              | Tip Top Prepared Cattle Feed ..                                          | Harris & Company, Meridian .....          |
| 17180              | Tip Top Prepared Cattle Feed ..                                          | Harris & Company, Meridian .....          |
| 17279              | Tip Top Prepared Cattle Feed ..                                          | Harris & Company, Meridian .....          |
|                    |                                                                          | Guarantee.....                            |
|                    | <b>HATTIESBURG GROCERY CO.,</b><br>Hattiesburg, Miss.                    |                                           |
| 17232              | Rice Polish .....                                                        | Hattiesburg Groc. Co., Hattiesburg ....   |
|                    |                                                                          | Guarantee.....                            |
|                    | <b>HAZEL MILLING COMPANY,</b><br>East St. Louis, Ill.                    |                                           |
| 17193              | Wheat Middlings .....                                                    | Conner-Vaughn Co., Columbia .....         |
|                    |                                                                          | Guarantee.....                            |
|                    | <b>HUNTER-ROBINSON-WENZ</b><br><b>MILLING COMPANY,</b><br>St. Louis, Mo. |                                           |
| 17144              | Dreadnaught Bran .....                                                   | E. Bonelli Co., Vicksburg .....           |
| 17289              | Dreadnaught Bran .....                                                   | Winner, Klein & Co., Meridian .....       |
|                    |                                                                          | Guarantee.....                            |
| 17146              | Wheat Bran .....                                                         | P. P. Williams Co., Vicksburg .....       |
| 17266              | Wheat Bran .....                                                         | E. Bonelli Co., Vicksburg .....           |
| 17269              | Weat Bran .....                                                          | P. P. Williams Co., Vicksburg .....       |
|                    |                                                                          | Guarantee.....                            |
| 17268              | Wheat Shorts.....                                                        | P. P. Williams Co., Vicksburg .....       |
|                    |                                                                          | Guarantee.....                            |
|                    | <b>IGLEHART BROTHERS,</b><br>Evansville, Ind.                            |                                           |
| 17285              | Middlings .....                                                          | Threefoot Bros. & Co., Meridian .....     |
|                    |                                                                          | Guarantee.....                            |
|                    | <b>ILLINOIS FEED MILLS,</b><br>St. Louis, Mo.                            |                                           |
| 17260              | Star Feed .....                                                          | Delta Grocery & Cotton Co., Clarksdale .. |
| 17141              | Star Feed .....                                                          | Hanes & Hood, Vicksburg.....              |
| 15795              | Star Feed .....                                                          | G. A. Wilson, Jr., Greenwood .....        |
| 15796              | Star Feed .....                                                          | Delta Grocery & Cotton Co., Clarksdale .. |
|                    |                                                                          | Guarantee.....                            |
| 17230              | Star Ox Feed .....                                                       | Merchants Groc. Co., Hattiesburg .....    |
|                    |                                                                          | Guarantee.....                            |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 15794              | 11.01              | 3.00          | 3.05                | 11.31                   | 41.74                   | 29.89                 |
| 17180              | 8.20               | 3.90          | 3.06                | 11.19                   | 44.02                   | 29.63                 |
| 17279              | 8.12               | 3.87          | 3.97                | 11.75                   | 43.19                   | 29.10                 |
|                    |                    |               | 3.50                | 12.50                   | 29.24                   | 33.81                 |
| 17232              | 11.12              | 6.32          | 8.18                | 11.31                   | 62.30                   | .77                   |
|                    |                    |               | 6.00                | 12.00                   | 55.00                   | 7.00                  |
| 17193              | 10.69              | 4.52          | 5.13                | 18.00                   | 59.69                   | 1.97                  |
|                    |                    |               | 3.55                | 15.00                   | 60.00                   | 3.00                  |
| 17144              | 10.36              | 6.07          | 4.02                | 14.81                   | 56.39                   | 8.35                  |
| 17289              | 8.10               | 6.75          | 5.01                | 15.94                   | 56.20                   | 8.00                  |
|                    |                    |               | 4.00                | 14.50                   | 55.00                   | 9.50                  |
| 17146              | 10.61              | 4.95          | 5.15                | 17.88                   | 54.98                   | 6.43                  |
| 17266              | 10.43              | 6.72          | 4.30                | 14.63                   | 54.56                   | 9.36                  |
| 17269              | 8.51               | 9.00          | 4.96                | 13.50                   | 53.87                   | 10.16                 |
|                    |                    |               | 3.50                | 14.50                   | 50.00                   | 9.50                  |
| 17268              | 9.37               | 7.31          | 6.45                | 20.63                   | 50.27                   | 5.97                  |
|                    |                    |               | 4.00                | 15.00                   | 55.00                   | 6.00                  |
| 17285              | 8.72               | 7.14          | 4.66                | 16.56                   | 57.84                   | 5.08                  |
|                    |                    |               | 4.00                | 15.50                   | 55.00                   | 5.00                  |
| 17260              | 9.90               | 4.64          | 4.31                | 12.75                   | 57.68                   | 10.72                 |
| 17141              | 8.64               | 4.54          | 4.33                | 13.63                   | 59.79                   | 9.07                  |
| 15795              | 10.40              | 4.15          | 4.34                | 12.38                   | 56.38                   | 12.35                 |
| 15796              | 10.93              | 4.28          | 3.92                | 12.63                   | 58.04                   | 10.20                 |
|                    |                    |               | 3.80                | 12.00                   | 58.00                   | 8.90                  |
| 17230              | 13.40              | 4.68          | 4.04                | 13.19                   | 56.87                   | 7.82                  |
|                    |                    |               | 3.50                | 14.00                   | 60.00                   | 11.00                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                            | Where and from Whom Collected.             |
|--------------------|----------------------------------------------------------------------------|--------------------------------------------|
|                    | <b>KELLY MILLING COMPANY,</b><br>Kansas City, Mo.                          |                                            |
| 15797              | Wheat Shorts.....                                                          | Tom Lyle Grocery Co., Meridian .....       |
| 17173              | Wheat Shorts.....                                                          | J. C. McClinton, Newton .....              |
|                    |                                                                            | Guarantee.....                             |
|                    | <b>KEMPER MILL &amp; ELEVATOR CO.</b><br>Kansas City, Mo.                  |                                            |
| 17169              | Wheat Bran .....                                                           | W. E. Laird, Hattiesburg .....             |
|                    |                                                                            | Guarantee.....                             |
| 15798              | Anchor Bran .....                                                          | F. S. Leavell, Oxford .....                |
| 17212              | Anchor Bran .....                                                          | C. H. Stevens Co., Richton .....           |
|                    |                                                                            | Guarantee.....                             |
| 17341              | Crescent Shorts .....                                                      | Farmers Warehouse Co., Iuka .....          |
|                    |                                                                            | Guarantee.....                             |
| 15799              | Carnation Shorts .....                                                     | Asa W. Allen, Tupelo .....                 |
|                    |                                                                            | Guarantee.....                             |
| 15800              | Shorts .....                                                               | Tutt-Millsbaugh Grain Co., Meridian .....  |
| 17176              | Shorts .....                                                               | J. L. Wells Inc. Co., Meridian.....        |
| 17183              | Shorts .....                                                               | Funkenstein & Co., Meridian .....          |
| 17187              | Shorts .....                                                               | Lampton & Co., Magnolia .....              |
|                    |                                                                            | Guarantee.....                             |
|                    | <b>KINGFALFA MILLS,</b><br>Nebraska City, Neb.                             |                                            |
| †17350             | Coupon Horse Feed .....                                                    | Wise Bros., Yazoo City .....               |
| †17382             | Coupon Horse Feed .....                                                    | Wise Bros., Yazoo City .....               |
|                    |                                                                            | Guarantee.....                             |
|                    | <b>LAWRENCE BROTHERS CO.,</b><br>Crowley, La.                              |                                            |
| 15802              | Rice Polish .....                                                          | W. E. Laird, Hattiesburg .....             |
| 15801              | Rice Polish .....                                                          | Lotterhos & Huber Co., Crystal Spg's ..... |
|                    |                                                                            | Guarantee.....                             |
|                    | <b>LAWRENCE &amp; HAMILTON FEED</b><br><b>COMPANY,</b><br>New Orleans, La. |                                            |
| 17320              | Stafolife .....                                                            | Foote-Patrick Co., Laurel .....            |
| 17317              | Stafolife .....                                                            | Guy Northrop, Pass Christian .....         |
| 17284              | Stafolife .....                                                            | J. L. Wells, Meridian .....                |
| 17223              | Stafolife .....                                                            | Capital Grocery Co., Jackson .....         |
| 17214              | Stafolife .....                                                            | Foote-Patrick Co., Laurel .....            |
| 17203              | Stafolife .....                                                            | Guy Northrop, Pass Christian .....         |
| 17202              | Stafolife .....                                                            | M. M. Moody, Long Beach .....              |
| 15803              | Stafolife .....                                                            | Capital Grocery Co., Jackson .....         |
| 15804              | Stafolife .....                                                            | Foote-Patrick Co., Laurel .....            |
|                    |                                                                            | Guarantee.....                             |

† Nos. 17350 and 17382 were taken from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent.   | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|-----------------------|-------------------------|-------------------------|-----------------------|
| 15797              | 10.67              | 4.88          | 5.33                  | 18.63                   | 54.85                   | 5.64                  |
| 17173              | 10.08              | 4.55          | 5.78<br><i>4.50</i>   | 17.94<br><i>17.00</i>   | 56.81<br><i>56.00</i>   | 4.84<br><i>5.00</i>   |
| 17169              | 10.00              | 6.33          | 4.04<br><i>4.00</i>   | 15.88<br><i>14.50</i>   | 55.06<br><i>53.50</i>   | 8.69<br><i>9.50</i>   |
| 15798              | 10.39              | 6.72          | 3.94                  | 16.31                   | 53.02                   | 9.62                  |
| 17212              | 11.31              | 6.82          | 4.34<br><i>4.00</i>   | 15.31<br><i>14.50</i>   | 50.40<br><i>53.50</i>   | 11.82<br><i>9.50</i>  |
| 17341              | 5.51               | 6.02          | 5.40<br><i>4.25</i>   | 19.19<br><i>16.00</i>   | 57.31<br><i>53.75</i>   | 6.57<br><i>8.00</i>   |
| 15799              | 9.30               | 4.66          | 5.02<br><i>4.30</i>   | 16.75<br><i>16.00</i>   | 58.90<br><i>56.25</i>   | 5.37<br><i>6.00</i>   |
| 15800              | 9.75               | 5.17          | 4.91                  | 19.88                   | 53.74                   | 6.55                  |
| 17176              | 10.02              | 5.09          | 4.88                  | 19.06                   | 54.71                   | 6.24                  |
| 17183              | 10.67              | 5.11          | 4.99                  | 18.69                   | 54.01                   | 6.53                  |
| 17187              | 10.48              | 4.38          | 4.64<br><i>5.25</i>   | 17.94<br><i>15.50</i>   | 57.36<br><i>61.25</i>   | 5.20<br><i>6.25</i>   |
| 17350              | 12.14              | 5.06          | 2.58                  | 10.38                   | 60.57                   | 9.27                  |
| 17382              | 11.45              | 5.16          | 3.29<br><i>3.50</i>   | 10.69<br><i>10.25</i>   | 60.77<br><i>55.00</i>   | 8.64<br><i>12.00</i>  |
| 15802              | 10.15              | 5.30          | 8.46                  | 11.25                   | 63.74                   | 1.10                  |
| 15801              | 10.70              | 6.49          | 10.78<br><i>10.50</i> | 12.31<br><i>11.37</i>   | 57.17<br><i>61.55</i>   | 2.55<br><i>1.75</i>   |
| 17320              | 7.91               | 11.24         | 5.56                  | 10.56                   | 52.73                   | 12.00                 |
| 17317              | 8.35               | 9.94          | 4.91                  | 11.00                   | 52.63                   | 13.17                 |
| 17284              | 7.48               | 9.84          | 5.43                  | 10.56                   | 64.85                   | 1.84                  |
| 17223              | 9.65               | 8.98          | 5.22                  | 11.69                   | 54.69                   | 9.77                  |
| 17214              | 10.86              | 9.77          | 5.31                  | 10.81                   | 51.34                   | 11.91                 |
| 17203              | 10.27              | 9.02          | 5.83                  | 11.13                   | 53.22                   | 10.53                 |
| 17202              | 10.49              | 9.98          | 5.71                  | 11.06                   | 53.50                   | 9.26                  |
| 15803              | 9.00               | 9.13          | 5.55                  | 11.63                   | 53.65                   | 11.04                 |
| 15804              | 9.50               | 9.19          | 5.27<br><i>6.00</i>   | 11.75<br><i>11.00</i>   | 54.33<br><i>53.00</i>   | 9.96<br><i>12.00</i>  |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                                 | Where and from Whom Collected.                          |
|--------------------|-----------------------------------------------------------------|---------------------------------------------------------|
|                    | <b>LEXINGTON FLOURING MILLS,</b><br>Lexington, Mo.              |                                                         |
| 17217              | Wheat Shorts.....                                               | R. H. Green & Bro., Jackson .....<br>Guarantee.....     |
|                    | <b>LEXINGTON MILL &amp; ELEVATOR COMPANY,</b><br>Lexington, Mo. |                                                         |
| *17276             | Wheat Shorts.....                                               | McInnis & Sturgis, Meridian .....<br>Guarantee* .....   |
|                    | <b>LIBERTY MILLS,</b><br>Nashville, Tenn.                       |                                                         |
| 17231              | Wheat Bran .....                                                | Merchants Groc. Co., Hattiesburg ....                   |
| 17190              | Wheat Bran .....                                                | R. Watts & Co., Seminary .....                          |
| 15805              | Wheat Bran .....                                                | D. W. Wilkinson & Bro., Jackson ....<br>Guarantee.....  |
| 17333              | Wheat Shorts.....                                               | Asa W. Allen, Tupelo .....                              |
| 17215              | Wheat Shorts.....                                               | D. W. Wilkinson & Bro., Jackson ....                    |
| 17175              | Wheat Shorts.....                                               | Queen City Feed Co., Meridian.....                      |
| 17159              | Wheat Shorts.....                                               | D. W. Wilkinson & Bro., Jackson ....                    |
| 15806              | Wheat Shorts.....                                               | Merchants Groc. Co., Hattiesburg ....<br>Guarantee..... |
|                    | <b>LUKINS MILLING COMPANY,</b><br>Atchison, Kansas.             |                                                         |
| 17311              | Wheat Shorts.....                                               | Gulfport Grocery Co., Gulfport .....<br>Guarantee ..... |
|                    | <b>J. C. LYSLE MILLING COMPANY,</b><br>Leavenworth, Kansas.     |                                                         |
| 17322              | Wheat Shorts.....                                               | Parker Bros. & Co., Sandersville .....                  |
| 17292              | Wheat Shorts.....                                               | W. H. Gallaspy Sons, Hickory .....<br>Guarantee.....    |
|                    | <b>MCCORD, CROCKETT &amp; KOLP,</b><br>Memphis, Tenn.           |                                                         |
| 17136              | Wheat Bran .....                                                | J. D. Roberts & Co., Yazoo City .....                   |
| 15807              | Wheat Bran .....                                                | Macon Mercantile Co., Macon .....<br>Guarantee.....     |
|                    | <b>McINNIS &amp; STURGIS,</b><br>Meridian, Miss.                |                                                         |
| 17323              | Mixed Rice Shorts .....                                         | J. H. Abney, Pachuta .....                              |
| 17278              | Mixed Rice Shorts .....                                         | McInnis & Sturgis, Meridian.....<br>Guarantee.....      |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17217              | 12.66              | 4.38          | 5.78<br>5.77        | 17.38<br>16.55          | 55.62<br>58.01          | 4.18<br>4.33          |
| 17276              | 10.15              | 3.98          | 4.22                | 15.81                   | 61.46                   | 4.38                  |
| 17231              | 13.31              | 6.62          | 4.12                | 14.56                   | 52.79                   | 8.60                  |
| 17190              | 9.32               | 6.44          | 4.48                | 14.50                   | 57.66                   | 7.60                  |
| 15805              | 11.00              | 6.43          | 3.58<br>4.00        | 14.38<br>14.50          | 55.40<br>50.00          | 9.21<br>9.50          |
| 17333              | 6.11               | 4.58          | 4.51                | 16.81                   | 62.66                   | 5.33                  |
| 17215              | 12.64              | 4.84          | 4.47                | 16.25                   | 56.25                   | 5.55                  |
| 17175              | 10.56              | 4.58          | 4.25                | 16.31                   | 58.76                   | 5.54                  |
| 17159              | 9.99               | 5.08          | 4.31                | 16.13                   | 58.19                   | 6.30                  |
| 15806              | 10.67              | 5.10          | 4.15<br>4.00        | 16.13<br>16.00          | 57.99<br>48.00          | 5.96<br>6.00          |
| 17311              | 9.24               | 5.22          | 4.13<br>4.00        | 18.06<br>13.00          | 58.09<br>55.00          | 5.26<br>9.00          |
| 17322              | 9.23               | 7.78          | 5.32                | 17.13                   | 53.37                   | 7.17                  |
| 17292              | 9.99               | 5.57          | 5.11<br>4.50        | 18.38<br>14.50          | 55.07<br>54.00          | 5.88<br>8.00          |
| 17136              | 8.99               | 6.25          | 4.08                | 17.44                   | 54.13                   | 9.11                  |
| 15807              | 9.66               | 6.85          | 4.51<br>3.50        | 15.25<br>10.00          | 52.55<br>50.00          | 11.18<br>12.00        |
| 17323              | 8.54               | 9.24          | 8.64                | 10.88                   | 51.58                   | 11.12                 |
| 17278              | 8.61               | 9.10          | 10.32<br>5.00       | 11.88<br>10.00          | 51.73<br>50.00          | 8.36<br>6.50          |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                         |
|--------------------|---------------------------------------------------------|--------------------------------------------------------|
|                    | <b>McMILLAN &amp; HARRISON,</b><br>Mobile, Ala.         |                                                        |
| *16211             | Alfalfa Syr Horse Feed .....                            | W. M. Canty, Pascagoula .....<br>Guarantee* .....      |
|                    | <b>GEO. B. MATTHEWS &amp; SONS,</b><br>New Orleans, La. |                                                        |
| 17239              | Rice Polish .....                                       | W. F. Funchess & Co., Osyka.....                       |
| 17237              | Rice Polish .....                                       | C. Atkinson's Sons Co., Summit .....<br>Guarantee..... |
|                    | <b>MEEK MILLING COMPANY,</b><br>Marissa, Ill.           |                                                        |
| 17174              | Wheat Shorts.....                                       | Henderson-Molpus Co., Philadelphia<br>Guarantee.....   |
|                    | <b>MILLSTADT MILLING COMPANY,</b><br>Millstadt, Ill.    |                                                        |
| 15808              | Wheat Bran .....                                        | Threefoot Bros. & Co., Meridian ....<br>Guarantee..... |
|                    | <b>NATIONAL FEED COMPANY,</b><br>St. Louis, Mo.         |                                                        |
| 17287              | Wheat Middlings .....                                   | Threefoot Brothers & Co., Meridian..                   |
| 17281              | Wheat Middlings .....                                   | Tom Lyle Grocery Co., Meridian .....                   |
| 15809              | Wheat Middlings .....                                   | Chas. Edler Groc. Co., Brookhaven<br>Guarantee.....    |
|                    | <b>NATIONAL RICE MILLING CO.,</b><br>New Orleans, La.   |                                                        |
| 17234              | Rice Polish .....                                       | J. K. Dunn, McComb.....                                |
| 17213              | Rice Polish .....                                       | Foote-Patrick Co., Laurel .....<br>Guarantee.....      |
|                    | <b>NEW ATHENS MILLING COMPANY,</b><br>New Athens, Ill.  |                                                        |
| 17229              | Wheat Bran .....                                        | Merchants Grocery Co., Hattiesburg<br>Guarantee.....   |
| 17197              | Bran & Wheat Screenings .....                           | Kennedy & Co., Wiggins .....<br>Guarantee.....         |
| 17294              | Middlings .....                                         | Clay Buckley Co., Stallo .....<br>Guarantee .....      |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 16211              | 11.99              | 6.71          | 1.78                | 11.13                   | 59.81                   | 8.58                  |
| 17239              | 10.67              | 3.78          | 9.83                | 11.50                   | 62.74                   | 1.48                  |
| 17237              | 11.05              | 4.96          | 8.34<br>5.00        | 10.31<br>10.00          | 64.16<br>50.00          | 1.18<br>12.00         |
| 17174              | 10.67              | 3.57          | 4.60<br>3.50        | 16.25<br>13.50          | 60.81<br>54.00          | 4.10<br>8.50          |
| 15808              | 10.75              | 7.04          | 4.24<br>3.50        | 14.94<br>11.27          | 53.79<br>59.54          | 9.24<br>6.04          |
| 17287              | 8.37               | 4.97          | 4.62                | 15.69                   | 61.80                   | 4.55                  |
| 17281              | 9.76               | 4.24          | 4.06                | 15.69                   | 61.26                   | 4.99                  |
| 15809              | 9.45               | 5.30          | 5.50<br>4.00        | 18.00<br>16.00          | 56.83<br>56.00          | 4.92<br>7.00          |
| 17234              | 9.93               | 6.50          | 9.27                | 11.63                   | 61.63                   | 1.04                  |
| 17213              | 10.92              | 4.12          | 9.90<br>11.00       | 11.50<br>11.63          | 62.44<br>60.05          | 1.12<br>1.60          |
| 17229              | 13.51              | 7.13          | 4.58                | 15.31                   | 48.51                   | 10.96                 |
| 17197              | 11.41              | 6.30          | 4.59<br>3.50        | 15.31<br>14.00          | 54.89<br>55.00          | 7.50<br>9.50          |
| 17294              | 10.45              | 2.49          | 3.78<br>3.50        | 15.44<br>13.50          | 66.07<br>55.00          | 1.77<br>8.00          |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                     | Where and from Whom Collected.                           |
|--------------------|-----------------------------------------------------|----------------------------------------------------------|
|                    | <b>NUTRILINE MILLING COMPANY,</b><br>Crowley, La.   |                                                          |
| 17316              | Nutriline .....                                     | W. A. McDonald, Bay St. Louis .....                      |
| 17290              | Nutriline .....                                     | Winner-Klein Co., Meridian .....                         |
| 15810              | Nutriline .....                                     | Merchants Grocery Co., Crystal Spgs.<br>Guarantee.....   |
|                    | <b>RAYNE RICE MILLING COMPANY,</b><br>Rayne, La.    |                                                          |
| 17150              | Pelican Mixed Feed .....                            | Rumble & Wensel Co., Natchez .....                       |
|                    | <b>PHOENIX FLOUR MILLS,</b><br>Evansville, Ind.     | Guarantee.....                                           |
| 17271              | Fancy Shorts .....                                  | Busick & Co., Brandon .....                              |
|                    | <b>GEO. P. PLANT MILLING CO.,</b><br>St. Louis, Mo. | Guarantee.....                                           |
| 17124              | Wheat Bran .....                                    | The Goyer Co., Greenville .....                          |
| 17145              | Wheat Bran .....                                    | R. L. Crook & Co., Vicksburg .....                       |
| 17148              | Wheat Bran .....                                    | B. Kullman & Co., Natchez .....                          |
| 17149              | Wheat Bran .....                                    | Geisenberger & Freidler, Natchez .....                   |
| 17151              | Wheat Bran .....                                    | Rumble & Wensel, Natchez .....                           |
| 17154              | Wheat Bran .....                                    | Postlethwait, Stewart Co., Natchez .....                 |
| 17204              | Wheat Bran .....                                    | Hood Milling Co., Gulfport .....                         |
| 17254              | Wheat Bran .....                                    | The Goyer Co., Greenville .....                          |
| 17280              | Wheat Bran .....                                    | Queen City Feed Co., Meridian .....                      |
| 17314              | Wheat Bran .....                                    | Union Naval Stores, Gulfport .....                       |
|                    |                                                     | Guarantee.....                                           |
| 17125              | Wheat Middlings .....                               | The Goyer Co., Greenville .....                          |
| 17201              | Wheat Middlings .....                               | M. M. Moody, Long Beach .....                            |
| 17205              | Wheat Middlings .....                               | Hood Milling Co., Gulfport .....                         |
| 17251              | Wheat Middlings .....                               | The Goyer Co., Greenville .....                          |
| 17313              | Wheat Middlings .....                               | Union Naval Stores, Gulfport .....                       |
|                    |                                                     | Guarantee.....                                           |
|                    | <b>QUAKER OATS COMPANY,</b><br>Chicago, Ill.        |                                                          |
| 17387              | Banner Feed .....                                   | Gaddis McLaurin & Co., Raymond.....                      |
| 15815              | Banner Feed .....                                   | C. A. Turner, Corinth .....                              |
| 15814              | Banner Feed .....                                   | Planters' Supply Co., Greenwood .....                    |
| 15813              | Banner Feed .....                                   | Myer Bros., Meridian .....                               |
| 17129              | Banner Feed .....                                   | Miss. Feed Co., Greenville .....                         |
| 17130              | Banner Feed .....                                   | Miss. Feed Co., Greenville .....                         |
| 17245              | Banner Feed .....                                   | Planters' Supply Co., Greenwood .....                    |
| 17255              | Banner Feed .....                                   | Miss. Feed Co., Greenville .....                         |
| 17262              | Banner Feed .....                                   | Clarke, Hearn, Campbell Co., Cl'ksd'le<br>Guarantee..... |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fiber—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17316              | 9.27               | 7.44          | 6.62                | 11.88                   | 55.41                   | 9.38                  |
| 17290              | 8.41               | 7.83          | 5.89                | 13.38                   | 54.85                   | 9.64                  |
| 15810              | 10.07              | 8.20          | 4.64                | 9.94                    | 57.83                   | 9.32                  |
|                    |                    |               | 3.50                | 12.00                   | 53.00                   | 10.00                 |
| 17150              | 10.07              | 9.44          | 3.31                | 10.31                   | 55.55                   | 11.32                 |
|                    |                    |               | 4.25                | 11.00                   | 54.00                   | 11.50                 |
| 17271              | 10.40              | 3.76          | 4.76                | 15.50                   | 61.10                   | 4.48                  |
|                    |                    |               | 4.00                | 14.50                   | 55.00                   | 7.00                  |
| 17124              | 10.42              | 6.00          | 4.12                | 16.00                   | 55.86                   | 7.60                  |
| 17145              | 9.42               | 6.70          | 3.87                | 15.69                   | 55.66                   | 8.66                  |
| 17148              | 9.58               | 6.36          | 4.19                | 16.00                   | 55.29                   | 8.58                  |
| 17149              | 9.22               | 6.38          | 4.54                | 16.56                   | 54.56                   | 8.74                  |
| 17151              | 9.94               | 6.35          | 4.19                | 16.19                   | 53.64                   | 9.69                  |
| 17154              | 9.65               | 5.86          | 4.41                | 16.38                   | 55.14                   | 8.56                  |
| 17204              | 11.20              | 6.13          | 4.38                | 15.50                   | 54.28                   | 8.51                  |
| 17254              | 10.41              | 6.44          | 4.39                | 16.63                   | 53.67                   | 8.46                  |
| 17280              | 8.28               | 6.16          | 4.94                | 15.38                   | 57.05                   | 8.19                  |
| 17314              | 8.97               | 7.08          | 4.56                | 16.19                   | 55.48                   | 7.72                  |
|                    |                    |               | 4.00                | 16.00                   | 54.00                   | 9.00                  |
| 17125              | 10.32              | 4.98          | 4.53                | 18.38                   | 56.74                   | 5.05                  |
| 17201              | 11.46              | 4.26          | 5.00                | 18.25                   | 56.27                   | 4.76                  |
| 17205              | 11.24              | 5.90          | 4.63                | 18.44                   | 54.97                   | 4.82                  |
| 17251              | 10.72              | 5.40          | 4.55                | 18.63                   | 55.43                   | 5.27                  |
| 17313              | 9.60               | 9.29          | 5.19                | 18.06                   | 52.98                   | 4.88                  |
|                    |                    |               | 4.41                | 17.11                   | 59.18                   | 5.18                  |
| 17387              | 11.59              | 3.03          | 3.10                | 9.81                    | 65.00                   | 7.47                  |
| 15815              | 9.89               | 3.70          | 2.79                | 9.81                    | 63.48                   | 10.33                 |
| 15814              | 9.68               | 3.00          | 3.28                | 9.50                    | 66.94                   | 7.60                  |
| 15813              | 9.71               | 6.20          | 4.17                | 9.81                    | 60.88                   | 9.23                  |
| 17129              | 9.12               | 3.53          | 3.80                | 10.31                   | 64.74                   | 8.50                  |
| 17130              | 9.66               | 3.58          | 4.08                | 10.38                   | 64.52                   | 7.78                  |
| 17245              | 10.40              | 3.33          | 3.28                | 9.13                    | 66.11                   | 7.75                  |
| 17255              | 10.12              | 3.80          | 3.88                | 9.44                    | 64.58                   | 8.18                  |
| 17262              | 9.06               | 3.47          | 4.02                | 10.06                   | 65.77                   | 7.62                  |
|                    |                    |               | 3.75                | 9.75                    | 63.00                   | 10.50                 |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                    | Where and from Whom Collected.        |
|--------------------|----------------------------------------------------|---------------------------------------|
| 17131              | Banner Scratching Grains .....                     | Miss. Feed Co., Greenville .....      |
|                    |                                                    | Guarantee.....                        |
| 15816              | Cracker Mule Feed .....                            | Foote-Patrick Co., Laurel .....       |
| 17128              | Cracker Mule Feed .....                            | Miss. Feed Co., Greenville .....      |
| 17246              | Cracker Mule Feed .....                            | Planters' Supply Co., Greenwood ..... |
| 17256              | Cracker Mule Feed .....                            | Miss. Feed Co., Greenville .....      |
|                    |                                                    | Guarantee.....                        |
| 17247              | Quaker Dairy Molasses Feed.....                    | Planters' Supply Co., Greenwood ..... |
|                    |                                                    | Guarantee.....                        |
| 17147              | Schumacher's Scratching Grains .....               | P. P. Williams Co., Vicksburg .....   |
|                    |                                                    | Guarantee.....                        |
|                    | <b>RALSTON PURINA COMPANY,</b><br>St. Louis, Mo.   |                                       |
| 17252              | Purina Feed .....                                  | The Goyer Co., Greenville .....       |
| 17172              | Purina Feed .....                                  | T. E. Winn, Laurel .....              |
| 17152              | Purina Feed .....                                  | Rumble & Wensel, Natchez .....        |
|                    |                                                    | Guarantee.....                        |
| 17222              | Purina Chick Feed .....                            | Capital Grocery Co., Jackson .....    |
|                    |                                                    | Guarantee.....                        |
| 17221              | Purina Scratch Feed.....                           | Capital Grocery Co., Jackson .....    |
| 17249              | Purina Scratch Feed.....                           | The Goyer Co., Greenville .....       |
|                    |                                                    | Guarantee.....                        |
| 17220              | Protena Feed .....                                 | Capital Grocery Co., .....            |
|                    |                                                    | Guarantee.....                        |
|                    | <b>REICHERT MILLING COMPANY,</b><br>Freeburg, Ill. |                                       |
| 17238              | Wheat Bran .....                                   | The Lampton Bros. Co., Tylertown .... |
|                    |                                                    | Guarantee.....                        |
|                    | <b>ST. MARY'S MILL COMPANY,</b><br>St. Mary's, Mo. |                                       |
| 17185              | Wheat Middlings .....                              | Jackson & Wallace Co., Kosciusko..... |
|                    |                                                    | Guarantee.....                        |
|                    | <b>SAUERS MILLING COMPANY,</b><br>Evansville, Ill. |                                       |
| 17186              | Shipstuff .....                                    | W. B. Potts & Sons Kosciusko,.....    |
|                    |                                                    | Guarantee.....                        |
|                    | <b>SCOTT COUNTY MILLING CO.,</b><br>Sikeston, Mo.  |                                       |
| 17184              | Wheat Middlings .....                              | G. Lowenberg & Co., Kosciusko .....   |
|                    |                                                    | Guarantee.....                        |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17131              | 11.32              | 1.65          | 3.11<br><i>3.50</i> | 10.44<br><i>10.00</i>   | 70.79<br><i>60.00</i>   | 2.69<br><i>5.00</i>   |
| 15816              | 11.22              | 3.88          | 2.92                | 9.75                    | 61.33                   | 10.90                 |
| 17128              | 9.73               | 3.98          | 3.54                | 10.00                   | 62.57                   | 10.18                 |
| 17246              | 9.75               | 4.25          | 3.46                | 9.75                    | 63.14                   | 9.65                  |
| 17256              | 9.93               | 4.29          | 3.67<br><i>3.50</i> | 9.50<br><i>10.00</i>    | 62.01<br><i>58.00</i>   | 10.60<br><i>12.00</i> |
| 17247              | 10.27              | 8.60          | 3.78<br><i>3.50</i> | 14.56<br><i>16.00</i>   | 48.38<br><i>50.00</i>   | 14.41<br><i>12.00</i> |
| 17147              | 10.92              | 2.08          | 3.19<br><i>3.50</i> | 11.19<br><i>10.00</i>   | 69.85<br><i>60.00</i>   | 2.77<br><i>5.00</i>   |
| 17252              | 10.64              | 4.08          | 4.39                | 13.13                   | 58.86                   | 8.90                  |
| 17172              | 9.53               | 3.69          | 4.00                | 12.13                   | 61.83                   | 8.82                  |
| 17152              | 9.90               | 4.40          | 3.74<br><i>4.00</i> | 13.00<br><i>12.50</i>   | 58.49<br><i>58.00</i>   | 10.47<br><i>8.90</i>  |
| 17222              | 12.53              | 2.53          | 3.91<br><i>3.60</i> | 11.25<br><i>11.00</i>   | 67.41<br><i>65.00</i>   | 2.37<br><i>4.00</i>   |
| 17221              | 13.12              | 1.91          | 3.31                | 11.44                   | 67.40                   | 2.82                  |
| 17249              | 12.16              | 3.66          | 2.78<br><i>3.60</i> | 11.25<br><i>11.00</i>   | 61.35<br><i>65.00</i>   | 8.80<br><i>4.00</i>   |
| 17220              | 13.04              | 4.26          | 4.07<br><i>3.80</i> | 12.63<br><i>12.00</i>   | 56.01<br><i>58.00</i>   | 9.99<br><i>8.90</i>   |
| 17238              | 11.77              | 7.07          | 4.78<br><i>4.50</i> | 15.50<br><i>15.50</i>   | 53.77<br><i>55.00</i>   | 7.11<br><i>9.00</i>   |
| 17185              | 10.80              | 3.87          | 5.38<br><i>4.20</i> | 17.25<br><i>15.81</i>   | 58.70<br><i>62.37</i>   | 4.00<br><i>2.90</i>   |
| 17186              | 10.88              | 3.88          | 4.58<br><i>4.20</i> | 16.13<br><i>14.96</i>   | 60.05<br><i>60.10</i>   | 4.48<br><i>4.92</i>   |
| 17184              | 11.14              | 3.75          | 5.07<br><i>5.93</i> | 16.06<br><i>16.27</i>   | 59.65<br><i>61.60</i>   | 4.33<br><i>4.50</i>   |



TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                            | Where and from Whom Collected                |
|--------------------|------------------------------------------------------------|----------------------------------------------|
|                    | <b>SIEWERD MILLING COMPANY,</b><br>New Orleans, La.        |                                              |
| 17198              | Rice Polish .....                                          | Kennedy Co., Wiggins .....                   |
|                    |                                                            | Guarantee.....                               |
|                    | <b>SOUTHERN RICE MILLING CO.,</b><br>New Orleans, La.      |                                              |
| *17235             | Rice Polish .....                                          | J. K. Dunn, McComb .....                     |
| *17160             | Rice Polish .....                                          | R. H. Green & Bro., Jackson .....            |
|                    |                                                            | Guarantee*.....                              |
|                    | <b>TAYLOR-WILLS GROCERY CO.,</b><br>Jackson, Miss.         |                                              |
| 17273              | Corn Chops.....                                            | Ross Bros. & Summer, Pelahatchie.....        |
|                    |                                                            | Guarantee* .....                             |
|                    | <b>TENNESSEE FIBRE COMPANY,</b><br>Memphis, Tenn.          |                                              |
| 17339              | Cremo Brand Feed Meal,<br>"Cow & Ox" .....                 | C. A. Turner, Corinth .....                  |
| 17315              | Cremo Brand Feed Meal,<br>"Cow & Ox" .....                 | Union Naval Stores, Gulfport .....           |
|                    |                                                            | Guarantee.....                               |
|                    | <b>THREEFOOT BROTHERS &amp; CO.,</b><br>Meridian, Miss.    |                                              |
| 17286              | Mixed Feed .....                                           | Threefoot Bros. & Co., Meridian.....         |
|                    |                                                            | Guarantee.....                               |
|                    | <b>TRENHOLM-KOLP COMPANY,</b><br>Memphis, Tenn.            |                                              |
| 17261              | Wheat Bran .....                                           | Delta Grocery & Cotton Co., Clarksdale ..... |
|                    |                                                            | Guarantee.....                               |
|                    | <b>TUTT-MILLSPAUGH GRAIN CO.,</b><br>Meridian, Miss.       |                                              |
| 17196              | Oxlife Cow & Ox Feed .....                                 | Columbia Grocery Co., Columbia .....         |
|                    |                                                            | Guarantee.....                               |
|                    | <b>UNITED STATES RICE MILLING COMPANY,</b><br>Crowley, La. |                                              |
| 17228              | Rice Polish .....                                          | Lotterhos & Huber Co., Crystal Sp'gs.        |
| 17158              | Rice Polish .....                                          | Lotterhos & Huber Co., Crystal Sp'gs.        |
|                    |                                                            | Guarantee.....                               |

\* No guarantee submitted, sale illegal.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17198              | 11.40              | 5.32          | 7.97<br>6.25        | 10.31<br>11.37          | 63.90<br>62.88          | 1.10<br>2.50          |
| 17235              | 10.70              | 6.36          | 10.33               | 11.44                   | 59.90                   | 1.27                  |
| 17160              | 10.52              | 8.35          | 12.08               | 11.63                   | 54.70                   | 2.72                  |
| 17273              | 10.94              | 1.34          | 4.30                | 7.81                    | 74.12                   | 1.49                  |
| 17339              | 4.51               | 4.92          | 5.87                | 23.94                   | 42.16                   | 18.60                 |
| 17315              | 8.35               | 5.20          | 5.21<br>5.00        | 21.25<br>20.00          | 40.17<br>36.00          | 19.82<br>25.00        |
| 17286              | 7.94               | 6.79          | 10.47<br>5.00       | 12.44<br>9.25           | 57.96<br>61.00          | 4.40<br>8.50          |
| 17261              | 9.77               | 6.62          | 4.67<br>3.60        | 16.88<br>14.00          | 53.26<br>52.00          | 8.80<br>9.50          |
| 17196              | 10.46              | 4.46          | 4.23<br>3.50        | 13.75<br>12.50          | 40.56<br>32.20          | 26.54<br>30.84        |
| 17228              | 10.86              | 5.79          | 10.23               | 15.81                   | 55.83                   | 1.48                  |
| 17158              | 9.81               | 4.83          | 9.81<br>11.22       | 12.13<br>11.25          | 62.56<br>61.54          | .86<br>2.77           |

TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number.                                   | Name of Brand and Manufacturer. | Where and from Whom Collected.                            |
|------------------------------------------------------|---------------------------------|-----------------------------------------------------------|
| <b>VALLEY MILLING COMPANY,</b><br>St. Louis, Mo.     |                                 |                                                           |
| 17259                                                | Acme Feed .....                 | Southern Commission Co., Greenville ..<br>Guarantee.....  |
| 17258                                                | Delta Feed .....                | Southern Commission Co., Greenville....<br>Guarantee..... |
| <b>J. W. VANCE,</b><br>Pierce City, Mo.              |                                 |                                                           |
| 17140                                                | Diamond Bran.....               | C. J. Edwards Co., Vicksburg .....                        |
| 17265                                                | Shorts .....                    | Hanes-Hood, Vicksburg .....                               |
| 17138                                                | Shorts .....                    | C. J. Edwards, Vicksburg .....                            |
| <b>JOHN WADE &amp; SONS,</b><br>Memphis, Tenn.       |                                 |                                                           |
| 17248                                                | Alfalfa Mixed Feed .....        | McMahon Grocery Co., Greenville .....                     |
| 17133                                                | Wheat Bran .....                | Belzoni Groc. Co., Belzoni .....                          |
| 17134                                                | Wheat Shorts.....               | Belzoni Groc. Co., Belzoni.....                           |
| 15818                                                | Wheat Shorts.....               | Clay Co. Cotton Oil Co., West Point....<br>Guarantee..... |
| 17263                                                | Purity Feed .....               | J. J. Pleasants, Clarksdale .....                         |
| 17328                                                | Purity Feed .....               | G. Lowenberg, McCool .....                                |
| <b>WASHBURN-CROSBY COMPANY,</b><br>Mnneapolis, Minn. |                                 |                                                           |
| 17334                                                | Standard Middlings .....        | J. J. Rogers & Sons, Tupelo .....                         |
| 15819                                                | Standard Middlings .....        | J. J. Rogers & Sons, Tupelo .....                         |
| 15820                                                | Standard Middlings .....        | Walton Bros., Newton .....                                |
| <b>WATERLOO MILLING COMPANY,</b><br>Waterloo, Ill.   |                                 |                                                           |
| 15821                                                | Wheat Bran .....                | Tupelo Grocery Co., Tupelo .....                          |
| 17336                                                | Wheat Middlings .....           | Clark Grocery Co., Tupelo .....                           |
| <b>WEBB &amp; MAURY,</b><br>Memphis, Tenn.           |                                 |                                                           |
| 15823                                                | Memphi Stock Feed .....         | Winner-Klein & Co., Meridian .....                        |

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17259              | 11.69              | 2.07          | 3.57<br>3.50        | 9.50<br>10.00           | 71.14<br>55.00          | 2.03<br>12.00         |
| 17258              | 9.05               | 3.30          | 4.92<br>4.25        | 10.25<br>9.25           | 65.09<br>50.00          | 7.39<br>12.00         |
| 17140              | 10.23              | 5.45          | 4.01<br>4.00        | 14.25<br>13.00          | 58.03<br>55.00          | 8.03<br>12.00         |
| 17265              | 10.35              | 5.12          | 6.40                | 16.44                   | 55.97                   | 5.72                  |
| 17138              | 10.59              | 4.27          | 4.60<br>4.00        | 16.50<br>12.00          | 58.03<br>55.00          | 6.01<br>12.00         |
| 17248              | 11.90              | 4.04          | 4.55<br>3.50        | 10.50<br>10.50          | 59.63<br>52.00          | 9.38<br>12.00         |
| 17133              | 9.28               | 6.67          | 4.03<br>3.50        | 17.00<br>10.00          | 54.41<br>50.00          | 8.61<br>12.00         |
| 17134              | 10.37              | 4.09          | 5.24                | 17.19                   | 56.19                   | 6.92                  |
| 15818              | 11.32              | 4.62          | 4.45<br>3.50        | 18.63<br>10.00          | 55.06<br>50.00          | 5.92<br>12.00         |
| 17263              | 10.05              | 2.83          | 4.25                | 9.44                    | 68.67                   | 4.76                  |
| 17328              | 9.15               | 2.72          | 3.66<br>4.25        | 9.25<br>9.25            | 69.85<br>65.00          | 5.37<br>5.50          |
| 17334              | 5.70               | 4.96          | 5.70                | 17.31                   | 58.92                   | 7.41                  |
| 15819              | 10.46              | 4.54          | 5.63                | 16.94                   | 55.11                   | 7.32                  |
| 15820              | 11.15              | 4.43          | 5.08<br>4.00        | 17.06<br>15.00          | 55.65<br>55.00          | 6.63<br>8.00          |
| 15821              | 11.20              | 6.66          | 4.47<br>4.00        | 15.38<br>15.00          | 53.74<br>50.00          | 8.55<br>8.25          |
| 17336              | 5.62               | 6.67          | 5.28<br>4.00        | 17.94<br>15.00          | 60.83<br>60.00          | 3.66<br>4.00          |
| 15823              | 10.71              | 6.26          | 3.75<br>3.50        | 15.75<br>14.00          | 50.51<br>40.00          | 13.02<br>12.00        |

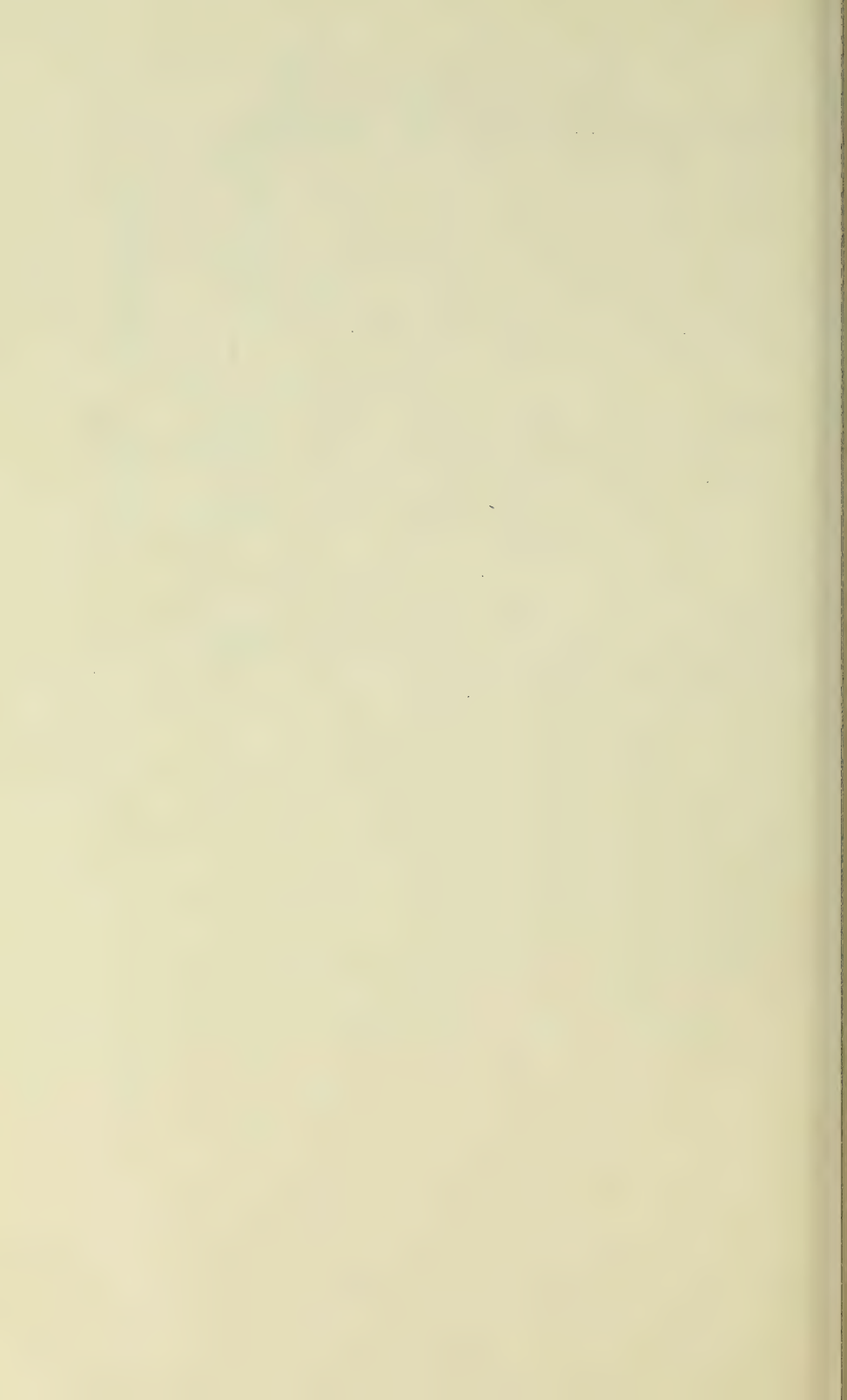


TABLE I.—Analyses of Commercial Feeding Stuffs

| Laboratory Number. | Name of Brand and Manufacturer.                         | Where and from Whom Collected.                        |
|--------------------|---------------------------------------------------------|-------------------------------------------------------|
|                    | <b>YATES &amp; DONELSON COMPANY,<br/>Memphis, Tenn.</b> |                                                       |
| 17227              | Wheat Bran .....                                        | Taylor-Wills Groc. Co., Jackson .....                 |
| 17135              | Wheat Bran .....                                        | Yazoo Grocery Co., Yazoo City .....<br>Guarantee..... |
| 17132              | Wheat Bran mixed with<br>Corn Bran.....                 | McMahon Groc. Co., Greenville .....<br>Guarantee..... |
|                    | <b>J. ZIMMERN'S COMPANY,<br/>Mobile, Ala.</b>           |                                                       |
| 17200              | Zimmern's Alfalfa, Molasses,<br>Corn and Oats .....     | L. Lopez & Company,' Biloxi .....<br>Guarantee.....   |

Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Ash—Per Cent. | Crude Fat—Per Cent. | Crude Protein—Per Cent. | Carbohydrates—Per Cent. | Crude Fibre—Per Cent. |
|--------------------|--------------------|---------------|---------------------|-------------------------|-------------------------|-----------------------|
| 17227              | 11.40              | 4.91          | 4.51                | 15.25                   | 57.60                   | 6.33                  |
| 17135              | 9.85               | 5.09          | 3.76                | 15.63                   | 58.93                   | 6.74                  |
|                    |                    |               | 3.53                | 14.85                   | 54.60                   | 10.00                 |
| 17132              | 9.56               | 5.20          | 4.30                | 14.31                   | 59.82                   | 6.81                  |
|                    |                    |               | 3.70                | 13.25                   | 57.15                   | 10.00                 |
| 17200              | 12.11              | 4.66          | 2.79                | 10.00                   | 64.20                   | 6.24                  |
|                    |                    |               | 3.90                | 10.25                   | 55.17                   | 7.65                  |



Mississippi Agricultural Experiment Station  
Agricultural College, Mississippi.

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BULLETIN No. 150.

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INSPECTION AND ANALYSES  
OF COMMERCIAL FERTILIZER

ON SALE IN THE STATE.



CHEMICAL LABORATORY.

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AGRICULTURAL COLLEGE, MISSISSIPPI

OCTOBER, 1911.



# MISSISSIPPI FERTILIZER AND FEEDING STUFF CONTROL.



## *INSPECTION AND ANALYSES OF FERTILIZERS.*

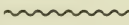


|                      |                   |
|----------------------|-------------------|
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| H. S. CHILTON.....   | ASSISTANT CHEMIST |
| E. C. McINNIS .....  | INSPECTOR         |
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| A. LEVY.....         | ASSISTANT CHEMIST |
| *F. N. CHISOLM ..... | INSPECTOR         |
| MISS MARY GAY.....   | STENOGRAPHER      |

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\* Resigned March 1.

# GENERAL INSPECTION OF COMMERCIAL FERTILIZERS.



**Introduction.**—The general results of the inspection of fertilizers and fertilizer materials for the season of 1910-1911 are presented and discussed in this bulletin. Two circulars were distributed during the months in which shipments were heavy. The last, Circular No. 33, contained analyses of more than 500 samples drawn by regular inspectors. An active inspection was maintained throughout the season.

Deficiencies established by careful sampling and analysis are always brought to the attention of the purchaser. The distribution of fertilizers in this state is very rapid, the bulk of the business being done in about ninety days; shipments often remain in the possession of merchants only a few days, and it not infrequently happens, therefore, that consignments found deficient by analysis cannot be reached and attached in accordance with the provisions of the statute.

**Purchasing on basis of analysis or guarantee.**—Since fertilizers made from materials of the same general character and availability are supplied by many manufacturers, a guarantee or a chemical analysis showing the amounts of the various forms of plant food present must be used as a basis in buying. Farmers and merchants should avail themselves of the information in this bulletin before making contracts for the coming year. Having decided upon the character of the fertilizer, the purchaser should then endeavor to secure as much plant food as possible for the money spent. These fertilizer bulletins will supply the information which will enable him to most surely do this.

**Fertilizers of low grade.**—Purchasers of fertilizers have often had their attention directed to the folly of buying fertilizers solely on the basis of the price asked for a ton.

It is not the price per ton of the fertilizer, but the price per pound of the plant food in it which should be subjected to inquiry by the merchant or farmer who is ready to buy.

A low grade fertilizer can be sold by the retailer at a comparatively low price per ton, but no saving is affected when the price per pound

of the valuable ingredients is considered. Merchants with the best interests of their customers in mind should not handle so-called cheap fertilizers.

Competition in **price alone**, instead of the more rational competition in **quality and in price** has resulted in many mistakes without doubt in the fertilizer trade. Manufacturers, intelligent merchants, and progressive farmers should lose no opportunity of protecting the general trade from the irrational and unfair competition wherein the price of a ton is the deciding factor in a transaction.

No "Off-Grade" fertilizer or cotton-seed meal should be allowed sold in this state. Dealers should not handle them because they happen to admit a more attractive margin of profit, and manufacturers should not make them, because they know that farmers should not be encouraged to buy them.

# GENERAL RESULTS OF THE INSPECTION

SEASON 1910-1911.



**Number of analyses.**—This bulletin contains analyses of 720 samples drawn by inspectors. The results of the analyses of the so-called official (manufacturers') samples are not published.

The classification given below shows the general distribution of analytical work during the last four seasons:

| SAMPLES OF                        | Season of<br>1907-1908 | Season of<br>1908-1909 | Season of<br>1909-1910 | Season of<br>1910-1911 |
|-----------------------------------|------------------------|------------------------|------------------------|------------------------|
| Complete fertilizer .....         | 345                    | 358                    | 435                    | 504                    |
| Acid phosphate .....              | 148                    | 174                    | 183                    | 175                    |
| Acid phosphate with potash ....   | 4                      |                        | 8                      | 4                      |
| Acid phosphate with nitrogen ..   |                        | 2                      | 10                     | 2                      |
| Ground bone .....                 | 3                      | 4                      | 2                      | 2                      |
| Potash salts .....                | 24                     | 26                     | 20                     | 21                     |
| Miscellaneous samples .....       | 2                      | 5                      | 7                      | 12                     |
| Total Inspectors' samples .....   | 526                    | 569                    | 665                    | 720                    |
| Official (manufacturers') samples | 294                    | 311                    | 402                    | 416                    |
| Total number of samples .....     | 820                    | 880                    | 1067                   | 1136                   |

Dealers or farmers who desire prompt analysis of samples drawn from goods in their possession, can always obtain them by making request for the results.

The following short comparative statement will show the general trend of the results of inspection during the last few years:



## MISSISSIPPI EXPERIMENT STATION.

## Comparative Statement.

| SEASON OF       | Number of<br>Tons sold in<br>State. | Number of In-<br>spectors' Sam-<br>ples Analyzed. | Number of Sam-<br>ples below<br>Guarantee in<br>Relative Value. | Percentage<br>below Guar-<br>antee in Relative<br>Value. | Percentage as<br>much or more<br>than 3% below<br>in Relative Val. |
|-----------------|-------------------------------------|---------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------|
| 1902-1903 ..... | 81,892.25                           | 262                                               | 28                                                              | 10.68                                                    |                                                                    |
| 1903-1904 ..... | 137,942.45                          | 280                                               | 42                                                              | 15.00                                                    |                                                                    |
| 1904-1905 ..... | 114,260.45                          | 399                                               | 35                                                              | 8.77                                                     |                                                                    |
| 1905-1906 ..... | 138,467.95                          | 437                                               | 33                                                              | 7.55                                                     | 3.43                                                               |
| 1906-1907 ..... | 138,669.75                          | 506                                               | 64                                                              | 12.64                                                    | 5.73                                                               |
| 1907-1908 ..... | 143,191.90                          | 526                                               | 117                                                             | 22.24                                                    | 9.88                                                               |
| 1908-1909 ..... | 139,884.10                          | 569                                               | 141                                                             | 24.60                                                    | 12.13                                                              |
| 1909-1910 ..... | 132,776.70                          | 665                                               | 164                                                             | 24.66                                                    | 13.83                                                              |
| 1910-1911 ..... | 148,237.00                          | 720                                               | 64                                                              | 8.42                                                     | 7.78                                                               |

The following tabular statement is also interesting from the standpoint of a general review of the results for the past three years:

|                                                                   | Season of<br>1908-1909 | Season of<br>1909-1910 | Season of<br>1910-1911 |
|-------------------------------------------------------------------|------------------------|------------------------|------------------------|
| Number of samples analyzed .....                                  | 569                    | 665                    | 720                    |
| Percentage equal or above guaranty<br>in everything .....         | 44.46                  | 41.65                  | 56.66                  |
| Percentage equal or above guaranty<br>in relative value .....     | 75.40                  | 75.34                  | 82.78                  |
| Percentage 4% or more above guar-<br>anty in relative value ..... | 48.86                  | 55.49                  | 63.61                  |
| Percentage 6% or more above guar-<br>anty in relative value ..... | 34.97                  | 43.61                  | 51.53                  |
| Percentage 10% or more above<br>guaranty in relative value .....  | 15.64                  | 26.47                  | 26.81                  |
| Percentage 4% or more below<br>guaranty in relative value .....   | 10.02                  | 12.03                  | 5.55                   |
| Percentage 6% or more below<br>guaranty in relative value .....   | 4.92                   | 6.62                   | 3.61                   |
| Percentage 10% or more below<br>guaranty in relative value .....  | 1.93                   | 3.01                   | 1.11                   |

The foregoing statements indicate a marked improvement for the season of 1910-1911. Deficiencies in relative commercial value decreased from over 20% for the past three seasons to 8.42% for this season.

Last year 13.83% of all samples analyzed were as much as 3% deficient in relative commercial value, while only 7.78% of a larger total number of samples analyzed this season were found to be deficient to the extent of 3% of the value guaranteed by the manufacturer. Only a very few (1.11%) samples were found 16% below guarantee in total value of plant food, while 26.81% of all samples examined are as much as 10% above guarantee in commercial value. Table III should be considered also in this connection, since general averages of all samples analyzed are compared therein with the averages of corresponding guaranties.

**Deficiencies in Nitrogen.**—For the past two years the especial attention of the trade has been directed to the rather large number of deficiencies in nitrogen brought to light by the analytical work. It is very gratifying to note the improvement shown by the results for this season. Table I will show that 14.26% of all determinations of nitrogen were as much as 8% below guarantee, as compared with 25.11% for 1909-1910 and 30.35% for 1908-1909. In the manufacture of fertilizers smaller margins are necessarily allowed in the case of nitrogen for lack of uniformity in raw materials or of homogeneity in mixtures. There is yet a distinct need, however, for wider margins or greater care in manufacture, because there is no good reason why we should yet find so large a percentage of samples deficient in their most valuable constituent.

The following statement is interesting in this connection, because it further illustrates the improved conditions this season with respect to nitrogen in standard grade and in high grade fertilizers:

|                                                                          | Season of<br>1908-1909<br>Per cent. | Season of<br>1909-1910<br>Per cent. | Season of<br>1910-1911 *<br>Per cent. |
|--------------------------------------------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------|
| Average of guaranties on nitrogen<br>in standard grade fertilizers ..... | 1.66                                | 1.66                                | 1.66                                  |
| <b>Average nitrogen found in standard<br/>grade fertilizers .....</b>    | <b>1.61</b>                         | <b>1.66</b>                         | <b>1.74</b>                           |
| Average of guaranties on nitrogen<br>in high grade fertilizers .....     | 1.65                                | 1.95                                | 2.02                                  |
| <b>Average nitrogen found in high<br/>grade fertilizers .....</b>        | <b>1.37</b>                         | <b>1.79</b>                         | <b>1.92</b>                           |
| Average of guaranties on nitrogen<br>in "vegetable" fertilizers .....    | 2.87                                | 2.86                                | 2.93                                  |
| Average nitrogen found in "vegeta-<br>ble" fertilizers.....              | 2.92                                | 2.87                                | 2.78                                  |

\* Average of guaranties for 1910-1911 includes only those brands represented by samples analyzed this season and does not necessarily include all guaranties on file.

**General averages.**—Table III on page 14 has been prepared for the purpose of giving a general view of the guaranties filed for the several classes of fertilizers, and the average composition of the goods sold them. Attention should be directed to the fact that the averages shown for inspectors' samples are not averages in a strict sense, since these results were obtained by making averages from the average analyses in table IV. This procedure, however, does not involve a serious loss of accuracy in these cases, and the table is interesting especially when considered in connection with tables I and II immediately preceding it.

**Sampling.**—Inspectors draw all samples in accordance with specific instructions. Every reasonable care is exercised by them, that they may draw samples as nearly representative in character as possible.

Duplicate samples are taken. Should one of them be found deficient, the other is analyzed also as a check against possible error. Manufacturers may obtain at any time portions of samples to be examined by their chemists.

**Reports of analyses.**—When analyses are completed they are reported to the manufacturers and those from whom samples were obtained. The especial attention of the owner and maker is directed to deficiencies brought to light by the chemical analyses, and every effort is made to see that the farmer, who is the principal sufferer in such cases, receives the protection which was contemplated when the system of inspection was inaugurated.

Most manufacturers are willing enough to protect their customers from loss due to unavoidable errors in manufacture and in most cases this also is done without discussion as to whether deficiencies are "material" within the meaning of section 2257 of the fertilizer law.

Some manufacturers, however, are somewhat disposed to view deficiencies reported in their goods as due to improper sampling or analysis. The facts, law, and circumstances are placed before the purchaser when nothing irregular is discovered in the history of those samples found below guarantee.

|                                                                       | Schedule of values: | per lb. | per unit. |
|-----------------------------------------------------------------------|---------------------|---------|-----------|
| For Nitrogen.....                                                     |                     | 21¼c    | \$4.25    |
| For Water Soluble Phosphoric Acid in mixed goods                      |                     | 5½c     | 1.10      |
| For Citrate Soluble Phosphoric Acid in mixed goods                    |                     | 5c      | 1.00      |
| For Water-Soluble Phosphoric Acid in plain Acid<br>Phosphates .....   |                     | 5c      | 1.00      |
| For Citrate-Soluble Phosphoric Acid in plain Acid<br>Phosphates ..... |                     | 4½c     | .90       |
| For total Phosphoric Acid in fine bone .....                          |                     | 3c      | .60       |
| For total Phosphoric Acid in medium and coarse<br>bone .....          |                     | 2½c     | .50       |
| For Potash .....                                                      |                     | 5c      | 1.00      |

The above figures possess a comparative significance only, but they are intended to approximate the relative market values of the valuable constituents of fertilizers; actual retail prices are controlled, of course, entirely by conditions of the market from time to time.



Table I.—A Summary of all Analyses Published.—Season 1910-1911.

| NAME AND ADDRESS OF MANUFACTURER.                                    | Number of Samples Analyzed. | Number of samples equal to or above guarantee in Available Phosphoric Acid, Nitrogen and Potash. | Number of samples found as much as five per cent below guarantee in Available Phosphoric Acid. | Number of samples found as much as eight per cent below guarantee in Nitrogen. | Number of samples found as much as eight per cent below guarantee in Potash. | Number of samples found as much as three per cent below guarantee in Relative Commercial Value. | Number of samples found to be equal to or above guarantee in Relative Commercial Value. |    |
|----------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----|
|                                                                      |                             |                                                                                                  |                                                                                                |                                                                                |                                                                              |                                                                                                 |                                                                                         |    |
| A. D. ADAIR & McCARTY BROS., Atlanta, Ga.                            | 1                           | 0                                                                                                | 0                                                                                              | 0                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 1  |
| ARMOUR FERTILIZER WORKS, New Orleans, La.                            | 5                           | 1                                                                                                | 0                                                                                              | 1                                                                              | 3                                                                            | 0                                                                                               | 0                                                                                       | 5  |
| BIRMINGHAM FERTILIZER Co., Birmingham, Ala.                          | 5                           | 2                                                                                                | 1                                                                                              | 0                                                                              | 1                                                                            | 1                                                                                               | 1                                                                                       | 4  |
| BROOKHAVEN COTTON OIL & FERTILIZER Co., Brookhaven, Miss.            | 6                           | 4                                                                                                | 0                                                                                              | 1                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 6  |
| CANTON OIL MILL Co., Canton, Miss.                                   | 5                           | 4                                                                                                | 0                                                                                              | 0                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 4  |
| CAPITAL FERTILIZER & M'F'G. Co., Jackson, Miss.                      | 42                          | 29                                                                                               | 0                                                                                              | 3                                                                              | 1                                                                            | 2                                                                                               | 0                                                                                       | 36 |
| CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. Co., Crystal Springs, Miss. | 8                           | 5                                                                                                | 0                                                                                              | 1                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 8  |
| EAGLE COTTON OIL Co., Meridian, Miss.                                | 6                           | 2                                                                                                | 0                                                                                              | 0                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 4  |
| A. H. GEORGE & COMPANY, Meridian, Miss.                              | 7                           | 1                                                                                                | 4                                                                                              | 2                                                                              | 0                                                                            | 3                                                                                               | 0                                                                                       | 4  |
| GERMAN KALI WORKS, Baltimore, Md.                                    | 6                           | 5                                                                                                | 0                                                                                              | 0                                                                              | 0                                                                            | 1                                                                                               | 1                                                                                       | 5  |
| GRASSELLI CHEMICAL Co., Birmingham, Ala.                             | 5                           | 1                                                                                                | 0                                                                                              | 4                                                                              | 0                                                                            | 0                                                                                               | 0                                                                                       | 5  |
| GREAT SOUTHERN PHOSPHATE Co., Mt. Pleasant, Tenn.                    | 59                          | 24                                                                                               | 0                                                                                              | 14                                                                             | 6                                                                            | 6                                                                                               | 0                                                                                       | 41 |
| GULFPORT FERTILIZER Co., Gulfport, Miss.                             | 23                          | 5                                                                                                | 5                                                                                              | 7                                                                              | 3                                                                            | 8                                                                                               | 0                                                                                       | 13 |
| HAZLEHURST OIL MILL & FERT. Co., Hazlehurst, Miss.                   | 13                          | 10                                                                                               | 2                                                                                              | 0                                                                              | 0                                                                            | 2                                                                                               | 2                                                                                       | 11 |
| JACKSON FERTILIZER COMPANY, Jackson, Miss.                           | 85                          | 55                                                                                               | 2                                                                                              | 5                                                                              | 6                                                                            | 3                                                                                               | 0                                                                                       | 77 |
| JEFFERSON FERTILIZER COMPANY, Birmingham, Ala.                       | 3                           | 1                                                                                                | 0                                                                                              | 0                                                                              | 0                                                                            | 1                                                                                               | 1                                                                                       | 2  |
| LAUREL OIL & FERTILIZER Co., Laurel, Miss.                           | 42                          | 26                                                                                               | 0                                                                                              | 1                                                                              | 1                                                                            | 1                                                                                               | 1                                                                                       | 37 |

|                                                      |     |       |      |       |       |       |       |    |   |
|------------------------------------------------------|-----|-------|------|-------|-------|-------|-------|----|---|
| LOTTERHOS & HUBER Co., Crystal Springs, Miss.        | 3   | 1     | 0    | 0     | 0     | 0     | 0     | 0  | 3 |
| MARBACH & EAGAN, Jackson, Miss.                      | 2   | 0     | 0    | 0     | 0     | 2     | 0     | 0  | 2 |
| MERIDIAN FERTILIZER FACTORY, Meridian, Miss.         | 103 | 76    | 2    | 3     | 6     | 2     | 2     | 98 |   |
| MISSISSIPPI FERTILIZER Co., Jackson, Miss.           | 10  | 6     | 0    | 1     | 0     | 0     | 0     | 8  |   |
| MT. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.     | 1   | 0     | 0    | 0     | 0     | 0     | 0     | 1  |   |
| NEW ORLEANS ACID & FERT. Co., New Orleans, La.       | 29  | 19    | 0    | 0     | 2     | 0     | 0     | 27 |   |
| NEWTON OIL & M'F'G. Co., Newton, Miss.               | 8   | 5     | 0    | 0     | 0     | 0     | 0     | 7  |   |
| NITRATE AGENCIES Co., New Orleans, La.               | 5   | 2     | 1    | 0     | 0     | 0     | 0     | 2  |   |
| PIONEER FERTILIZER Co., Florence, Ala.               | 1   | 1     | 0    | 0     | 0     | 0     | 0     | 1  |   |
| PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La. | 15  | 3     | 3    | 3     | 8     | 6     | 7     | 7  |   |
| PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.        | 2   | 1     | 0    | 0     | 1     | 0     | 0     | 2  |   |
| READ PHOSPHATE COMPANY, Nashville, Tenn.             | 11  | 2     | 0    | 6     | 0     | 4     | 5     | 5  |   |
| REFUGE COTTON OIL Co., Columbus, Miss.               | 18  | 5     | 1    | 4     | 5     | 1     | 9     | 9  |   |
| SHUBUTA OIL & M'F'G. Co., Shubuta, Miss.             | 2   | 2     | 0    | 0     | 0     | 0     | 0     | 2  |   |
| SOUTHERN OIL & FERTILIZER Co., Meridian, Miss.       | 23  | 14    | 0    | 2     | 7     | 0     | 0     | 23 |   |
| STANDARD GUANO & CHEM. M'F'G. Co., New Orleans, La.  | 28  | 15    | 5    | 4     | 0     | 5     | 23    | 23 |   |
| TENNESSEE VALLEY FERT. Co., Florence, Ala.           | 20  | 8     | 4    | 2     | 1     | 2     | 14    | 14 |   |
| THREEFOOT BROTHERS & Co., Meridian, Miss.            | 3   | 1     | 0    | 0     | 1     | 0     | 3     | 3  |   |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss.             | 33  | 23    | 3    | 0     | 1     | 4     | 27    | 27 |   |
| VIRGINIA-CAROLINA CHEMICAL Co., Memphis, Tenn.       | 79  | 46    | 2    | 10    | 3     | 4     | 70    | 70 |   |
| WESSON COTTON OIL & FERT. Co., Wesson, Miss.         | 3   | 3     | 0    | 0     | 0     | 0     | 0     | 3  |   |
| TOTALS                                               | 720 | 408   | 35   | 74    | 58    | 56    | 596   |    |   |
| Percentages                                          |     | 56.66 | 5.05 | 14.26 | 10.86 | 7.78  | 82.78 |    |   |
| Totals for Season 1909-1910                          | 665 | 277   | 54   | 114   | 73    | 92    | 501   |    |   |
| Percentages for Season 1909-1910                     |     | 41.65 | 8.49 | 25.11 | 15.66 | 13.83 | 75.34 |    |   |
| Totals for Season 1908-1909                          | 569 | 253   | 27   | 112   | 89    | 69    | 429   |    |   |
| Percentages for Season 1908-1909                     |     | 44.46 | 4.98 | 30.35 | 22.94 | 12.13 | 75.40 |    |   |
| Totals for Season 1907-1908                          | 526 | 275   | 37   | 57    | 32    | 52    | 409   |    |   |
| Percentages for Season 1907-1908                     |     | 52.28 | 7.37 | 16.28 | 8.53  | 9.88  | 77.76 |    |   |
| Totals for Season 1906-1907                          | 506 | 285   | 27   | 47    | 47    | 29    | 442   |    |   |
| Percentages for Season 1906-1907                     |     | 56.32 | 5.33 | 13.35 | 12.43 | 5.73  | 87.35 |    |   |
| Totals for Season 1905-1906                          | 437 | 246   | 16   | 66    | 15    | 15    | 404   |    |   |
| Percentages for Season 1905-1906                     |     | 56.29 | 3.78 | 19.64 | 4.36  | 3.43  | 92.45 |    |   |

TABLE II.—A Further Summary of all Analyses published.—Season 1910-1911.

| NAME AND ADDRESS OF MANUFACTURER.                                  | Number of Samples Analyzed. | Number equal to or above guarantee in available Phosphoric Acid, Nitrogen and Potash. | Number equal or above guarantee in Relative Value. | Number as much as four per cent above guarantee in Relative Value. | Number ten per cent of more above guarantee in Relative Value. | Number as much as four per cent below guarantee in Relative Value. | Number as much as six per cent below guarantee in Relative Value. | Number ten per cent or more below guarantee in Relative Value. |
|--------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------|
|                                                                    |                             |                                                                                       |                                                    |                                                                    |                                                                |                                                                    |                                                                   |                                                                |
| A. D. ADAIR & McCARTY Bros., Atlanta, Ga.                          | 1                           | 0                                                                                     | 1                                                  | 0                                                                  | 0                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| ARMOUR FERTILIZER WORKS, New Orleans, La.                          | 5                           | 1                                                                                     | 5                                                  | 4                                                                  | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| BIRMINGHAM FERTILIZER CO., Birmingham, Ala.                        | 5                           | 2                                                                                     | 4                                                  | 3                                                                  | 0                                                              | 1                                                                  | 0                                                                 | 0                                                              |
| BROOKHAVEN COTTON OIL & FERT. CO., Brookhaven, Miss.               | 6                           | 4                                                                                     | 6                                                  | 5                                                                  | 5                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| CANTON OIL MILL CO., Canton, Miss.                                 | 5                           | 4                                                                                     | 4                                                  | 4                                                                  | 2                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| CAPITAL FERTILIZER & M'F'G. CO., Jackson, Miss.                    | 42                          | 29                                                                                    | 36                                                 | 27                                                                 | 13                                                             | 0                                                                  | 0                                                                 | 0                                                              |
| CRYSTAL SPRINGS OIL MILL, FERT. & M'F'G. CO., Cryst'l Sp'gs, Miss. | 8                           | 5                                                                                     | 8                                                  | 8                                                                  | 7                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| EAGLE COTTON OIL CO., Meridian, Miss.                              | 6                           | 2                                                                                     | 4                                                  | 4                                                                  | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| A. H. GEORGE & COMPANY, Meridian, Miss.                            | 7                           | 1                                                                                     | 0                                                  | 0                                                                  | 0                                                              | 3                                                                  | 2                                                                 | 2                                                              |
| GERMAN KALI WORKS, Baltimore, Md.                                  | 6                           | 5                                                                                     | 5                                                  | 3                                                                  | 0                                                              | 1                                                                  | 0                                                                 | 0                                                              |
| GRASSELLI CHEMICAL CO., Birmingham, Ala.                           | 5                           | 1                                                                                     | 5                                                  | 1                                                                  | 1                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| GREAT SOUTHERN PHOSPHATE CO., Mt. Pleasant, Tenn.                  | 59                          | 24                                                                                    | 41                                                 | 27                                                                 | 16                                                             | 3                                                                  | 2                                                                 | 2                                                              |
| GULFPORT FERTILIZER CO., Gulfport, Miss.                           | 23                          | 5                                                                                     | 13                                                 | 8                                                                  | 3                                                              | 7                                                                  | 6                                                                 | 0                                                              |
| HAZLEHURST OIL MILL & FERT. CO., Hazlehurst, Miss.                 | 13                          | 10                                                                                    | 11                                                 | 9                                                                  | 8                                                              | 2                                                                  | 2                                                                 | 0                                                              |
| JACKSON FERTILIZER CO., Jackson, Miss.                             | 85                          | 55                                                                                    | 77                                                 | 48                                                                 | 32                                                             | 9                                                                  | 1                                                                 | 0                                                              |
| JEFFERSON FERTILIZER CO., Birmingham, Ala.                         | 3                           | 1                                                                                     | 2                                                  | 0                                                                  | 0                                                              | 0                                                                  | 0                                                                 | 0                                                              |
| LAUREL OIL & FERTILIZER CO., Laurel, Miss.                         | 42                          | 26                                                                                    | 37                                                 | 31                                                                 | 19                                                             | 1                                                                  | 0                                                                 | 0                                                              |

|                                                      |     |       |       |       |       |       |       |      |      |      |
|------------------------------------------------------|-----|-------|-------|-------|-------|-------|-------|------|------|------|
| LOTTERHOS & HUBER Co., Crystal Springs, Miss.        | 3   | 1     | 3     | 1     | 1     | 0     | 0     | 0    | 0    | 0    |
| MARBACH & EAGAN, Jackson, Miss.                      | 2   | 0     | 2     | 2     | 2     | 1     | 0     | 0    | 0    | 0    |
| MERIDIAN FERTILIZER FACTORY, Meridian, Miss.         | 103 | 76    | 98    | 88    | 81    | 40    | 2     | 0    | 0    | 0    |
| MISSISSIPPI FERTILIZER FACTORY, Jackson, Miss.       | 10  | 6     | 8     | 7     | 6     | 4     | 0     | 0    | 0    | 0    |
| Mt. PLEASANT FERTILIZER Co., Mt. Pleasant, Tenn.     | 1   | 1     | 1     | 1     | 1     | 0     | 0     | 0    | 0    | 0    |
| NEW ORLEANS ACID & FERT. Co., New Orleans, La.       | 29  | 19    | 27    | 23    | 15    | 9     | 0     | 0    | 0    | 0    |
| NEWTON OIL & M'F'g. Co., Newton, Miss.               | 8   | 5     | 7     | 3     | 3     | 2     | 0     | 0    | 0    | 0    |
| NITRATE AGENCIES Co., New Orleans, La.               | 5   | 2     | 2     | 1     | 0     | 0     | 0     | 0    | 0    | 0    |
| PIONEER FERTILIZER Co., Florence, Ala.               | 1   | 1     | 1     | 1     | 1     | 1     | 0     | 0    | 0    | 0    |
| PLANTERS FERTILIZER & CHEMICAL Co., New Orleans, La. | 15  | 3     | 7     | 2     | 1     | 0     | 6     | 5    | 1    | 1    |
| PLANTERS OIL MILL & GIN Co., Kosciusko, Miss.        | 2   | 1     | 2     | 2     | 2     | 0     | 0     | 0    | 0    | 0    |
| READ PHOSPHATE Co., Nashville, Tenn.                 | 11  | 2     | 5     | 3     | 1     | 0     | 3     | 1    | 0    | 0    |
| REFUGUE COTTON OIL Co., Columbus, Miss.              | 18  | 5     | 9     | 3     | 3     | 1     | 1     | 1    | 0    | 0    |
| SHUBUTA OIL & M'F'g. Co., Shubuta, Miss.             | 2   | 2     | 2     | 2     | 2     | 1     | 0     | 0    | 0    | 0    |
| SOUTHERN OIL & FERT. Co., Meridian, Miss.            | 23  | 14    | 23    | 21    | 20    | 19    | 0     | 0    | 0    | 0    |
| STANDARD GUANO & CHEM. M'F'g. Co., New Orleans, La.  | 28  | 15    | 23    | 20    | 19    | 6     | 4     | 3    | 1    | 1    |
| TENNESSEE VALLEY FERT. Co., Florence, Ala.           | 20  | 8     | 14    | 13    | 12    | 6     | 0     | 0    | 0    | 0    |
| THREEFoot Bros. & Co., Meridian, Miss.               | 3   | 1     | 3     | 2     | 2     | 2     | 0     | 0    | 0    | 0    |
| TUPELO FERTILIZER FACTORY, Tupelo, Miss.             | 33  | 23    | 27    | 21    | 17    | 5     | 3     | 2    | 0    | 0    |
| VIRGINIA-CAROLINA CHEMICAL Co., Memphis, Tenn.       | 79  | 46    | 70    | 58    | 46    | 23    | 2     | 0    | 0    | 0    |
| WESSON COTTON OIL & FERT. Co., Wesson, Miss.         | 3   | 3     | 3     | 2     | 2     | 2     | 0     | 0    | 0    | 0    |
| TOTALS .....                                         | 720 | 408   | 596   | 458   | 371   | 193   | 40    | 26   | 8    | 8    |
| Percentages .....                                    |     | 56.66 | 82.78 | 63.61 | 51.53 | 26.81 | 5.55  | 3.61 | 1.11 | 1.11 |
| Totals for Season 1909-1910 .....                    | 665 | 277   | 501   | 369   | 290   | 176   | 80    | 44   | 20   | 20   |
| Percentages for Season 1909-1910 .....               |     | 41.65 | 75.34 | 55.49 | 43.61 | 26.47 | 12.03 | 6.62 | 3.01 | 3.01 |
| Totals for Season 1908-1909 .....                    | 569 | 253   | 429   | 278   | 199   | 89    | 57    | 28   | 11   | 11   |
| Percentages for Season 1908-1909 .....               |     | 44.46 | 75.40 | 48.86 | 34.97 | 15.64 | 10.02 | 4.92 | 1.93 | 1.93 |



TABLE III.—Average of Guaranties Compared with Average Composition of the Fertilizers Sold Under Them.—Season 1910-1911.

|                                                                     | Number of Guaranties | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Commercial Value Per Ton. |
|---------------------------------------------------------------------|----------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|------------------------------------|
|                                                                     |                      |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                                    |
| Average of guaranties on H. G. Acid Phosphate 16% .....             | 27                   | 13.04              | 2.96                    | 16.00                     | 1.44                |                     |                    |                  | 15.71                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>14.88</b>       | <b>3.65</b>             | <b>16.55</b>              | <b>.44</b>          |                     |                    |                  | <b>16.20</b>                       |
| Average of guaranties on H. G. Acid Phosphates other than 16% ..... | 7                    | 11.14              | 2.86                    | 14.00                     | 1.71                |                     |                    |                  | 13.71                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>12.82</b>       | <b>3.29</b>             | <b>15.20</b>              | <b>.91</b>          |                     |                    |                  | <b>14.88</b>                       |
| Average of guaranties on S. G. Acid Phosphate .....                 | 3                    | 9.00               | 3.00                    | 12.00                     | 2.00                |                     |                    |                  | 11.70                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>12.06</b>       | <b>3.34</b>             | <b>12.59</b>              | <b>.44</b>          |                     |                    |                  | <b>12.25</b>                       |
| Average of guaranties on S. G. Complete Fertilizers .....           | 81                   | 7.14               | 2.37                    | 9.51                      | 1.50                |                     | 1.66               | 1.53             | 18.81                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>12.59</b>       | <b>3.25</b>             | <b>10.53</b>              | <b>.90</b>          |                     | <b>1.74</b>        | <b>1.73</b>      | <b>20.39</b>                       |
| Average of guaranties on H. G. Complete Fertilizers .....           | 18                   | 7.36               | 2.69                    | 10.05                     | 1.79                |                     | 2.02               | 1.77             | 21.14                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>12.75</b>       | <b>2.85</b>             | <b>10.80</b>              | <b>1.38</b>         |                     | <b>1.92</b>        | <b>1.89</b>      | <b>21.63</b>                       |
| Average of guaranties on H. G. "Vegetable" Fertilizers .....        | 8                    | 4.94               | 1.94                    | 6.88                      | 1.24                |                     | 2.93               | 4.62             | 24.44                              |
| <b>Average of analyses of inspectors' samples .....</b>             |                      | <b>11.72</b>       | <b>2.62</b>             | <b>8.34</b>               | <b>1.71</b>         |                     | <b>2.78</b>        | <b>4.69</b>      | <b>25.42</b>                       |

This table includes only those guaranties represented by samples published during season 1910-1911. See paragraph on "General Averages," page 8 for remarks concerning above average analyses of inspectors' samples.



TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                                                                                   | Number of Samples Averaged.                      | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                                                                                   |                                                  |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| <b>BROOKHAVEN COTTON OIL &amp; FERT. CO., PANAMA,</b><br>Brookhaven, Miss.<br>S. G. Brookhaven Blood & Bone ..... | Average of all analyses .....<br>Guarantee ..... | 2 14.98            | 7.54<br>8.00            | 3.65<br>2.00              | 11.19<br>10.00      | .98<br>1.00         | 2.22<br>1.65       | 1.56<br>1.00     | 22.94<br>18.81          |
| H. G. Corn King .....                                                                                             | Average of all analyses .....<br>Guarantee ..... | 1 8.50             | 7.13<br>6.00            | 3.51<br>2.00              | 10.64<br>8.00       | .82<br>1.00         | 2.80<br>3.30       | 1.53<br>1.50     | 24.78<br>24.13          |
| S. G. Cotton Tail .....                                                                                           | Average of all analyses .....<br>Guarantee ..... | 3 9.01             | 7.32<br>7.50            | 4.55<br>2.50              | 11.87<br>10.00      | .51<br>1.00         | 2.09<br>2.00       | .53<br>.25       | 22.01<br>19.50          |
| <b>CANTON OIL MILL COMPANY,</b><br>Canton, Miss.                                                                  |                                                  |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate .....                                                                                        | Average of all analyses .....<br>Guarantee ..... | 2 14.40            | 14.65<br>12.00          | 2.93<br>4.00              | 17.58<br>16.00      | .25<br>1.00         |                    |                  | 17.29<br>15.60          |
| H. G. Half & Half .....                                                                                           | Average of all analyses .....<br>Guarantee ..... | 1 9.94             | 7.16<br>6.50            | 2.62<br>3.00              | 9.78<br>9.50        | .36<br>1.00         | 3.41<br>3.00       | .94<br>3.00      | 25.93<br>23.65          |
| H. G. Paragon .....                                                                                               | Average of all analyses .....<br>Guarantee ..... | 2 10.67            | 9.61<br>8.00            | 2.57<br>4.00              | 12.18<br>12.00      | .86<br>1.00         | 2.15<br>2.00       | .63<br>.50       | 22.90<br>21.80          |
| <b>CAPITAL FERT. &amp; M'FG. CO.,</b><br>Jackson, Miss.                                                           |                                                  |                    |                         |                           |                     |                     |                    |                  |                         |
| Extra H. G. Acid Phosphate 16% .....                                                                              | Average of all analyses .....<br>Guarantee ..... | 11 14.39           | 13.07<br>12.00          | 3.40<br>4.00              | 16.47<br>16.00      | .37<br>1.00         |                    |                  | 16.13<br>15.60          |





TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                       | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|-------------------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                       |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| <b>A. H. GEORGE &amp; COMPANY,</b><br>Meridian, Miss. |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate 16%.....                         | 2                           | 17.32              | 11.56                   | 4.16                      | 15.72               | .58                 |                    |                  | 15.30                   |
| Guarantee.....                                        |                             |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 15.70                   |
| S. G. George's Cotton King .....                      | 5                           | 12.87              | 6.09                    | 3.13                      | 9.22                | .57                 | 1.39               | 2.14             | 17.89                   |
| Guarantee.....                                        |                             |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.50               | 2.00             | 19.18                   |
| <b>GERMAN KALI WORKS,</b><br>Baltimore, Md.           |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| S. G. German Kainit .....                             | 4                           | 5.80               |                         |                           |                     |                     |                    | 12.83            | 12.83                   |
| Guarantee.....                                        |                             |                    |                         |                           |                     |                     |                    | 12.00            | 12.00                   |
| H. G. Muriate of Potash .....                         | 2                           | 2.57               |                         |                           |                     |                     |                    | 50.36            | 50.36                   |
| Guarantee.....                                        |                             |                    |                         |                           |                     |                     |                    | 50.00            | 50.00                   |
| <b>GRASSELLI CHEMICAL CO.,</b><br>Birmingham, Ala.    |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Grasselli's Blood Meal Mixture .....            | 2                           | 13.75              | 7.28                    | 4.30                      | 11.58               | .32                 | 1.30               | 2.28             | 20.11                   |
| Guarantee.....                                        |                             |                    | 7.00                    | 3.00                      | 10.00               | .75                 | 1.65               | 2.00             | 19.71                   |
| S. G. Grasselli's Blood Meal Mixture .....            | 2                           | 14.62              | 7.46                    | 3.89                      | 11.35               | .32                 | 1.31               | 1.92             | 19.58                   |
| Guarantee.....                                        |                             |                    | 7.00                    | 3.00                      | 10.00               | .50                 | 1.65               | 1.50             | 19.21                   |

|                                                                                  |    |       |       |      |       |       |      |       |       |
|----------------------------------------------------------------------------------|----|-------|-------|------|-------|-------|------|-------|-------|
| S. G. Grasselli's Fertilizer .....                                               | 1  | 11.17 | 7.88  | 3.08 | 10.96 | .40   | 1.70 | 1.83  | 20.80 |
| <b>GREAT SOUTHERN PHOSPHATE</b><br><b>COMPANY,</b><br><b>Mt. Pleasant, Tenn.</b> |    |       | 7.00  | 3.00 | 10.00 | .75   | 1.65 | 1.50  | 19.21 |
| Great Southern Special H. G.<br>Acid Phosphate .....                             | 10 | 13.73 | 13.34 | 3.89 | 17.23 | .61   |      |       | 16.84 |
|                                                                                  |    |       | 14.00 | 2.00 | 16.00 | 2.00  |      |       | 15.80 |
| Great Southern H. G. Acid<br>Phosphate .....                                     | 2  | 12.04 | 12.03 | 3.30 | 15.33 | 3.40  |      |       | 15.00 |
|                                                                                  |    |       | 12.00 | 2.00 | 14.00 | 2.00  |      |       | 13.80 |
| H. G. Best by Test .....                                                         | 14 | 10.59 | 6.82  | 3.93 | 10.75 | 4.93  |      | 2.08  | 20.15 |
|                                                                                  |    |       | 7.00  | 3.00 | 10.00 | 5.00  | 1.56 | 2.00  | 19.71 |
| S. G. Ever Ready .....                                                           | 3  | 10.11 | 5.92  | 4.65 | 10.57 | 7.66  | 1.65 | 1.83  | 12.99 |
|                                                                                  |    |       | 7.00  | 3.00 | 10.00 | 5.00  |      | 2.00  | 12.70 |
| S. G. Farmers Favorite .....                                                     | 13 | 10.42 | 6.29  | 4.25 | 10.54 | 6.24  | 1.62 | 1.24  | 19.29 |
|                                                                                  |    |       | 7.00  | 3.00 | 10.00 | 5.00  | 1.65 | 1.00  | 18.71 |
| H. G. General Lee Cotton<br>Grower .....                                         | 4  | 11.01 | 6.98  | 4.04 | 11.02 | 5.16  | 1.55 | 1.20  | 19.51 |
|                                                                                  |    |       | 8.00  | 3.00 | 11.00 | 5.00  | 1.65 | 1.00  | 19.81 |
| H. G. The Boys Corn Club<br>Special .....                                        | 3  | 9.33  | 4.70  | 3.70 | 8.40  | 7.39  | 1.78 | 2.09  | 18.53 |
|                                                                                  |    |       | 6.00  | 2.00 | 8.00  | 2.00  | 2.46 | 2.00  | 21.06 |
| O. G. The Planters Champion<br>Guarantee .....                                   | 4  | 10.79 | 6.76  | 4.17 | 10.93 | 6.91  | .91  | 1.03  | 16.50 |
|                                                                                  |    |       | 7.00  | 3.18 | 10.18 | 5.00  | .82  | 1.00  | 15.37 |
| S. G. Universal Cotton Grower<br>Guarantee .....                                 | 4  | 8.98  | 5.04  | 4.39 | 9.43  | 8.37  | 1.48 | 1.91  | 18.13 |
|                                                                                  |    |       | 6.00  | 2.35 | 8.35  | 5.00  | 1.65 | 2.00  | 17.96 |
| S. G. Kainit .....                                                               | 2  | 2.01  |       |      |       |       |      | 12.13 | 12.13 |
|                                                                                  |    |       |       |      |       |       |      | 12.00 | 12.00 |
| <b>GULFPORT FERT. CO.,</b><br><b>Gulfport, Miss.</b>                             |    |       |       |      |       |       |      |       |       |
| Primo H. G. Acid Phos-<br>phate 16% .....                                        | 6  | 19.73 | 13.16 | 1.97 | 15.13 | .15   |      |       | 14.94 |
|                                                                                  |    |       | 14.00 | 2.00 | 16.00 | 1.00  |      |       | 15.80 |
| Primo H. G. Bone Meal .....                                                      | 1  | 7.59  |       |      |       | 28.56 | 1.79 |       | 21.89 |
|                                                                                  |    |       |       |      |       | 18.50 | 2.47 |       | 19.75 |

TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                                           |                                           | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|---------------------------------------------------------------------------|-------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                                           |                                           |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| Primo S. G. Cotton Seed Meal Compound .....                               | Average of all analyses<br>Guarantee..... | 5                           | 15.95              | 7.09<br>7.00            | 1.99<br>2.00              | 9.08<br>9.00        | .26<br>1.00         | 1.68<br>1.65       | 2.39<br>2.00     | 19.32<br>18.71          |
| Primo H. G. Cottonseed Meal Mixture .....                                 | Average of all analyses<br>Guarantee..... | 2                           | 17.34              | 9.78<br>8.00            | .62<br>2.00               | 10.40<br>10.00      | .15<br>1.00         | 1.39<br>1.65       | 1.83<br>2.00     | 19.11<br>19.81          |
| Primo S. G. Cotton Special .....                                          | Average of all analyses<br>Guarantee..... | 1                           | 14.89              | 9.03<br>8.00            | 1.55<br>2.00              | 10.58<br>10.00      | .27<br>1.00         | 1.78<br>1.65       | 1.69<br>1.50     | 20.74<br>19.31          |
| Primo H. G. Fruit Tree Extra .....                                        | Average of all analyses<br>Guarantee..... | 1                           | 10.66              | 6.56<br>5.00            | .66<br>1.00               | 7.22<br>6.00        | .17<br>1.00         | 2.10<br>2.47       | 7.77<br>8.00     | 24.57<br>25.00          |
| Primo S. G. R. B. Super-phosphate .....                                   | Average of all analyses<br>Guarantee..... | 5                           | 13.96              | 6.06<br>7.00            | 3.65<br>2.00              | 9.71<br>9.00        | 1.67<br>1.00        | 1.58<br>1.65       | 1.96<br>2.00     | 18.99<br>18.71          |
| Primo S. G. Special Aurora .....                                          | Average of all analyses<br>Guarantee..... | 1                           | 13.82              | 8.79<br>8.00            | .86<br>2.00               | 9.65<br>10.00       | .17<br>1.00         | 1.54<br>1.65       | .42<br>.35       | 17.49<br>18.16          |
| Primo S. G. German Kainit .....                                           | Average of all analyses<br>Guarantee..... | 1                           | 2.89               | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 14.14<br>12.00   | 14.14<br>12.00          |
| <b>HAZLEHURST OIL MILL &amp; FERTILIZER COMPANY,</b><br>Hazlehurst, Miss. |                                           |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate .....                                                | Average of all analyses<br>Guarantee..... | 5                           | 16.79              | 11.32<br>14.00          | 4.22<br>2.00              | 15.54<br>16.00      | .84<br>1.00         |                    |                  | 15.12<br>16.80          |
| S. G. Imperial Fertilizer .....                                           | Average of all analyses<br>Guarantee..... | 8                           | 14.67              | 8.91<br>7.00            | 2.38<br>2.00              | 11.29<br>9.00       | .34<br>1.00         | 1.75<br>1.65       | 1.81<br>1.75     | 21.42<br>18.46          |

| <b>JACKSON FERTILIZER CO.,<br/>Jackson, Miss.</b> |                                           |    |       |                       |                     |                       |                     |                       |
|---------------------------------------------------|-------------------------------------------|----|-------|-----------------------|---------------------|-----------------------|---------------------|-----------------------|
| H. G. Acid Phosphate 16%.....                     | Average of all analyses<br>Guarantee..... | 2  | 14.53 | 13.95<br><i>14.00</i> | 2.85<br><i>2.00</i> | 16.80<br><i>16.00</i> | .26<br><i>1.00</i>  | 16.52<br><i>15.80</i> |
| H. G. Red Band Acid Phos-<br>phate .....          | Average of all analyses<br>Guarantee..... | 24 | 14.97 | 13.60<br><i>14.00</i> | 3.01<br><i>2.00</i> | 16.61<br><i>16.00</i> | .43<br><i>1.00</i>  | 16.30<br><i>15.80</i> |
| S. G. Big Horn Blood &<br>Bone .....              | Average of all analyses<br>Guarantee..... | 1  | 13.17 | 7.84<br><i>8.50</i>   | 2.75<br><i>1.25</i> | 10.59<br><i>9.75</i>  | .68<br><i>1.00</i>  | 20.37<br><i>19.41</i> |
| H. G. Bone Meal .....                             | Average of all analyses<br>Guarantee..... | 1  | 6.29  |                       |                     |                       | <i>24.08</i>        | 22.54<br><i>21.95</i> |
| S. G. Chicago R. B. Super-<br>phosphate .....     | Average of all analyses<br>Guarantee..... | 4  | 12.08 | 7.11<br><i>7.50</i>   | 3.59<br><i>2.00</i> | 10.70<br><i>9.50</i>  | .71<br><i>1.00</i>  | 20.36<br><i>18.76</i> |
| H. G. Blue Ribbon Peanut<br>Grower .....          | Average of all analyses<br>Guarantee..... | 2  | 11.78 | 5.57<br><i>7.00</i>   | 3.58<br><i>2.00</i> | 9.15<br><i>9.00</i>   | .50<br><i>1.00</i>  | 18.10<br><i>17.95</i> |
| S. G. Early Dixie .....                           | Average of all analyses<br>Guarantee..... | 3  | 9.00  | 7.79<br><i>8.00</i>   | 3.24<br><i>2.00</i> | 11.03<br><i>10.00</i> | 1.04<br><i>1.00</i> | 21.74<br><i>19.60</i> |
| H. G. Fruit & Vegetable .....                     | Average of all analyses<br>Guarantee..... | 4  | 12.26 | 6.20<br><i>3.00</i>   | 1.77<br><i>3.00</i> | 7.97<br><i>6.00</i>   | .65<br><i>1.00</i>  | 21.92<br><i>20.93</i> |
| H. G. Huber's Veribest .....                      | Average of all analyses<br>Guarantee..... | 3  | 10.63 | 6.19<br><i>5.50</i>   | 2.28<br><i>2.00</i> | 8.47<br><i>7.50</i>   | .65<br><i>1.00</i>  | 28.22<br><i>27.41</i> |
| S. G. Lampton's R. B.<br>Superphosphate .....     | Average of all analyses<br>Guarantee..... | 2  | 10.75 | 7.12<br><i>7.50</i>   | 3.38<br><i>2.00</i> | 10.50<br><i>9.50</i>  | .64<br><i>1.00</i>  | 20.60<br><i>18.76</i> |
| S. G. New Era Acid & Meal<br>Mixture .....        | Average of all analyses<br>Guarantee..... | 1  | 11.69 | 7.12<br><i>8.00</i>   | 3.71<br><i>2.00</i> | 10.83<br><i>10.00</i> | .74<br><i>1.00</i>  | 19.41<br><i>18.16</i> |
| H. G. Nitrate of Soda .....                       | Average of all analyses<br>Guarantee..... | 1  | 2.43  |                       |                     |                       |                     | 65.28<br><i>63.75</i> |
| S. G. Royal "C" Brand .....                       | Average of all analyses<br>Guarantee..... | 35 | 12.89 | 7.83<br><i>8.50</i>   | 2.48<br><i>1.25</i> | 10.31<br><i>9.75</i>  | .64<br><i>1.00</i>  | 20.36<br><i>19.41</i> |
| S. G. German Kainit .....                         | Average of all analyses<br>Guarantee..... | 2  | 5.22  |                       |                     |                       |                     | 12.78<br><i>12.00</i> |



TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and<br>Manufacturer.                                |                               | Number of Samples<br>Averaged. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |                        | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value<br>Per Ton. |
|-------------------------------------------------------------------|-------------------------------|--------------------------------|--------------------|----------------------------|------------------------------|------------------------|------------------------|--------------------|------------------|----------------------------|
|                                                                   |                               |                                |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. | Insoluble<br>Per Cent. |                    |                  |                            |
| <b>JEFFERSON FERTILIZER<br/>COMPANY,<br/>Birmingham, Ala.</b>     | Average of all analyses ..... | 1                              | 14.73              | 13.79                      | 1.51                         | 15.30                  | .09                    |                    |                  | 15.50                      |
|                                                                   | Guarantee.....                |                                |                    | 12.00                      | 4.00                         | 16.00                  | 2.00                   |                    |                  | 15.60                      |
|                                                                   | Average of all analyses ..... | 1                              | 15.55              | 8.88                       | 1.28                         | 10.16                  | .46                    | 1.57               | 2.22             | 19.94                      |
|                                                                   | Guarantee.....                |                                |                    | 7.00                       | 3.00                         | 10.00                  | 2.00                   | 1.65               | 2.00             | 19.71                      |
| <b>LAUREL OIL &amp; FERTILIZER<br/>COMPANY,<br/>Laurel, Miss.</b> | Average of all analyses ..... | 1                              | 14.44              | 9.39                       | .68                          | 10.07                  | .06                    | 1.73               | 2.09             | 20.45                      |
|                                                                   | Guarantee.....                |                                |                    | 7.00                       | 3.00                         | 10.00                  | 2.00                   | 1.65               | 2.00             | 19.71                      |
|                                                                   | Average of all analyses ..... | 8                              | 15.38              | 11.68                      | 4.31                         | 15.99                  | .82                    |                    |                  | 15.56                      |
|                                                                   | Guarantee.....                |                                |                    | 12.00                      | 4.00                         | 16.00                  | 2.00                   |                    |                  | 15.60                      |
| H. G. Acid Phosphate 16%.....                                     | Average of all analyses ..... | 4                              | 14.92              | 12.08                      | 3.53                         | 15.61                  | .61                    |                    |                  | 15.26                      |
|                                                                   | Guarantee.....                |                                |                    | 12.00                      | 2.00                         | 14.00                  | 2.00                   |                    |                  | 13.80                      |
|                                                                   | Average of all analyses ..... | 1                              | 15.57              | 8.20                       | 2.70                         | 10.90                  | 1.06                   | 1.12               | 2.51             | 18.99                      |
|                                                                   | Guarantee.....                |                                |                    | 8.00                       | 2.00                         | 10.00                  | 2.00                   | 1.00               | 2.00             | 17.05                      |
| S. G. K. C. Ammoniated<br>Bone .....                              | Average of all analyses ..... | 3                              | 12.21              | 6.97                       | 3.32                         | 10.29                  | .65                    | 1.62               | 1.97             | 19.84                      |
|                                                                   | Guarantee.....                |                                |                    | 8.00                       | 1.50                         | 9.50                   | 2.00                   | 1.40               | 1.50             | 17.75                      |

|                                                             |    |       |       |      |       |      |       |       |       |
|-------------------------------------------------------------|----|-------|-------|------|-------|------|-------|-------|-------|
| S. G. Meal & Phosphate Mixture .....                        | 3  | 10.10 | 7.55  | 4.06 | 11.61 | .73  | 2.29  | .62   | 22.71 |
| Guarantee.....                                              |    |       | 7.50  | 2.00 | 9.50  | 2.00 | 2.00  | .50   | 19.25 |
| H. G. Muriate of Potash .....                               | 1  | 2.26  |       |      |       |      |       | 50.80 | 50.80 |
| Guarantee.....                                              |    |       |       |      |       |      |       | 50.00 | 50.00 |
| H. G. Nitrate of Soda .....                                 | 1  | 2.06  |       |      |       |      | 15.06 |       | 64.01 |
| Guarantee.....                                              |    |       |       |      |       |      | 15.00 |       | 63.75 |
| S. G. G. Plow Brand .....                                   | 21 | 13.26 | 7.98  | 2.78 | 10.76 | 1.08 | 1.67  | 2.18  | 20.84 |
| Guarantee.....                                              |    |       | 7.50  | 2.00 | 9.50  | 2.00 | 1.65  | 1.50  | 18.76 |
| <b>LOTTERHOS &amp; HUBER CO.,</b><br>Crystal Springs, Miss. |    |       |       |      |       |      |       |       |       |
| O. G. G. Pomace .....                                       | 3  | 9.76  |       |      |       |      |       |       | 20.95 |
| Guarantee.....                                              |    |       |       |      |       | 1.85 | 4.49  | .94   | 20.38 |
| <b>MARBACH &amp; EAGAN,</b><br>Jackson, Miss.               |    |       |       |      |       |      |       |       |       |
| Bat Guano .....                                             | 2  | 14.47 |       |      |       | 8.08 | 3.63  | .53   | 20.00 |
| Guarantee.....                                              |    |       |       |      |       | 5.50 | 3.50  | .63   | 18.26 |
| <b>MERIDIAN FERT. FACTORY,</b><br>Meridian, Miss.           |    |       |       |      |       |      |       |       |       |
| H. G. Meridian Southern Acid Phosphate .....                | 4  | 15.42 | 11.97 | 3.65 | 15.62 | .48  |       |       | 15.26 |
| Guarantee.....                                              |    |       | 10.00 | 4.00 | 14.00 | 1.00 |       |       | 13.60 |
| H. G. Meridian Union Special Acid Phosphate .....           | 26 | 13.40 | 13.25 | 4.05 | 17.30 | .34  |       |       | 16.90 |
| Guarantee.....                                              |    |       | 13.00 | 3.00 | 16.00 | 1.00 |       |       | 15.70 |
| S. G. G. Meridian Blood & Bone .....                        | 14 | 12.65 | 7.72  | 3.51 | 11.22 | 1.17 | 1.68  | 1.67  | 20.81 |
| Guarantee.....                                              |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 1.65  | 1.50  | 19.21 |
| H. G. Dried Blood .....                                     | 1  | 9.91  |       |      |       |      | 12.98 |       | 55.17 |
| Guarantee.....                                              |    |       |       |      |       |      |       |       |       |
| S. G. G. Meridian Home Mixture .....                        | 51 | 13.32 | 8.04  | 3.24 | 11.28 | .90  | 1.75  | 1.75  | 21.27 |
| Guarantee.....                                              |    |       | 8.00  | 2.00 | 10.00 | 1.00 | 1.65  | 1.50  | 19.31 |
| S. G. G. Jack Gaston's Cotton & Corn Grower .....           | 1  | 12.20 | 7.39  | 3.52 | 10.91 | 1.02 | 1.83  | 1.71  | 21.14 |
| Guarantee.....                                              |    |       | 8.00  | 2.00 | 10.00 | 1.00 | 1.65  | 1.50  | 19.31 |

TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                       | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|-------------------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                       |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| S. G. Meridian Meal Mixture.....                      | 3                           | 10.91              | 8.76<br>7.00            | 3.39<br>3.00              | 12.15<br>10.00      | 1.19<br>1.00        | 1.96<br>2.00       | .58<br>.50       | 21.93<br>19.70          |
| S. G. Meridian Soluble Guano .....                    | 1                           | 14.74              | 7.77<br>7.00            | 2.89<br>2.50              | 10.66<br>9.50       | .88<br>1.00         | 1.66<br>1.40       | 1.99<br>1.50     | 20.48<br>17.65          |
| H. G. Meridian Vegetable Grower .....                 | 1                           | 12.20              | 7.61<br>6.00            | 2.14<br>2.00              | 9.75<br>8.00        | 2.19<br>1.00        | 2.56<br>2.50       | 5.07<br>5.00     | 26.46<br>24.23          |
| S. G. Meridian German Kainit .....                    | 1                           | 8.98               |                         |                           |                     |                     |                    | 13.04<br>12.00   | 13.04<br>12.00          |
| <b>MISSISSIPPI FERTILIZER CO.,<br/>Jackson, Miss.</b> |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate 16%.....                         | 4                           | 15.94              | 12.34<br>13.00          | 3.81<br>3.00              | 16.15<br>16.00      | .58<br>1.00         |                    |                  | 15.77<br>15.70          |
| S. G. Blood & Bone .....                              | 2                           | 13.63              | 8.01<br>7.50            | 4.26<br>2.00              | 12.27<br>9.50       | 1.35<br>1.00        | 1.52<br>1.65       | 1.45<br>1.20     | 20.98<br>18.46          |
| S. G. Horse Shoe Brand.....                           | 2                           | 12.77              | 6.94<br>7.50            | 3.24<br>2.00              | 10.18<br>9.50       | .97<br>1.00         | 1.81<br>1.65       | 2.06<br>1.80     | 20.63<br>19.06          |
| S. G. Improved Miss. Mixt. ....                       | 2                           | 14.81              | 8.11<br>7.50            | 2.85<br>2.00              | 10.96<br>9.50       | .36<br>1.00         | 1.75<br>1.65       | 2.06<br>1.80     | 21.26<br>19.06          |

|                                                                                   |   |       |                |              |                |              |              |                |                |
|-----------------------------------------------------------------------------------|---|-------|----------------|--------------|----------------|--------------|--------------|----------------|----------------|
| <b>MT. PLEASANT FERTILIZER CO.,</b><br>Mt. Pleasant, Tenn.                        | 1 | 9.38  | 6.58<br>7.00   | 5.30<br>3.00 | 11.88<br>10.00 | 4.38<br>5.00 | 1.55<br>1.65 | 1.02<br>1.00   | 20.15<br>18.71 |
| S. G. North Miss. Cotton<br>Grower .....                                          |   |       |                |              |                |              |              |                |                |
| <b>NEW ORLEANS ACID &amp; FER-</b><br><b>TILIZER COMPANY,</b><br>New Orleans, La. | 6 | 13.38 | 13.47<br>12.00 | 3.34<br>4.00 | 16.81<br>16.00 | .18<br>2.00  |              |                | 16.48<br>15.60 |
| H. G. Bull Dog Acid Phos-<br>phate .....                                          |   |       |                |              |                |              |              |                |                |
| H. G. New Orleans Acid<br>Phosphate .....                                         | 3 | 11.01 | 12.04<br>12.00 | 2.64<br>2.00 | 14.68<br>14.00 | .19<br>2.00  |              |                | 14.42<br>13.80 |
| S. G. Black Diamond Acid<br>Phosphate .....                                       | 1 | 11.44 | 9.53<br>10.00  | 2.35<br>2.00 | 11.88<br>12.00 | .62<br>2.00  |              |                | 11.65<br>11.80 |
| S. G. Am. R. B. Super-<br>phosphate & Potash .....                                | 2 | 10.32 | 4.40<br>7.00   | 4.48<br>2.00 | 8.88<br>9.00   | .33<br>2.00  | 1.92<br>1.65 | 2.12<br>1.50   | 19.60<br>18.21 |
| S. G. Blood, Bone & Beef<br>Guarantee .....                                       | 2 | 10.63 | 4.62<br>7.00   | 4.72<br>2.00 | 9.34<br>9.00   | .34<br>2.00  | 1.79<br>1.65 | 1.55<br>1.50   | 18.94<br>18.21 |
| H. G. Economizer .....                                                            | 2 | 12.73 | 8.34<br>8.00   | 2.16<br>2.00 | 10.50<br>10.00 | .23<br>2.00  | 1.68<br>1.65 | 2.27<br>2.00   | 20.74<br>19.81 |
| H. G. Farmers Cornucopia<br>Guarantee .....                                       | 2 | 13.05 | 10.05<br>10.00 | 1.87<br>2.00 | 11.92<br>12.00 | .30<br>2.00  | 3.00<br>2.47 | 2.30<br>2.00   | 27.98<br>25.50 |
| S. G. Gold Dust .....                                                             | 2 | 13.94 | 7.03<br>7.00   | 3.28<br>2.00 | 10.31<br>9.00  | .76<br>2.00  | 2.05<br>1.65 | 1.61<br>1.50   | 21.33<br>18.21 |
| S. G. Goldsmith's Improved<br>Mixture .....                                       | 7 | 13.33 | 7.07<br>7.00   | 3.29<br>2.00 | 10.36<br>9.00  | .70<br>2.00  | 1.86<br>1.65 | 1.57<br>1.50   | 20.54<br>18.21 |
| H. G. Muriate of Potash<br>Guarantee .....                                        | 1 | 3.64  |                |              |                |              |              | 49.18<br>50.00 | 49.18<br>50.00 |
| H. G. Vegetable Grower .....                                                      | 1 | 11.84 | 4.44<br>4.00   | 2.48<br>2.00 | 6.92<br>6.00   | .55<br>2.00  | 2.42<br>2.17 | 4.35<br>4.00   | 22.00<br>20.90 |



TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                      | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|------------------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                      |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| <b>NEWTON OIL &amp; M'F'G. CO.,</b><br>Newton, Miss. |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate 16%.....                        | 2                           | 12.36              | 12.09                   | 4.53                      | 16.62               | .42                 |                    |                  | 16.17                   |
| Guarantee.....                                       |                             |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 15.80                   |
| S. G. Banner C. & C. Brand                           | 5                           | 12.67              | 7.57                    | 2.31                      | 9.88                | .83                 | 1.86               | 3.03             | 21.58                   |
| Guarantee.....                                       |                             |                    | 7.00                    | 1.50                      | 8.50                | 1.00                | 1.65               | 2.25             | 18.46                   |
| H. G. Farmers Special                                | 1                           | 12.54              | 9.64                    | 2.79                      | 12.43               | .31                 | 2.10               | .70              | 23.02                   |
| Mixture .....                                        |                             |                    | 8.00                    | 3.50                      | 11.50               | 1.50                | 2.25               | .50              | 22.36                   |
| <b>NITRATE AGENCIES COMPANY,</b><br>New Orleans, La. |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate 16%.....                        | 1                           | 16.29              | 12.77                   | 4.11                      | 16.88               | .20                 |                    |                  | 16.47                   |
| Guarantee.....                                       |                             |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 15.80                   |
| Basic Slag.....                                      | 1                           | .40                | .04                     | 10.09                     | 10.13               | 6.03                |                    |                  | 9.12                    |
| H. G. Nitrate of Soda .....                          | 3                           | 2.14               |                         |                           | 17.00               |                     | 15.17              |                  | 64.48                   |
| Guarantee.....                                       |                             |                    |                         |                           |                     |                     | 15.25              |                  | 64.81                   |
| <b>PIONEER FERTILIZER CO.,</b><br>Florence, Ala.     |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| O. G. Pioneer Cotton Grower                          | 1                           | 13.28              | 7.54                    | 3.92                      | 11.46               | .33                 | 1.19               | 1.33             | 18.60                   |
| Guarantee.....                                       |                             |                    | 8.00                    | 2.18                      | 10.18               | 2.00                | .82                | 1.00             | 15.47                   |



TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                                  |                         | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|------------------------------------------------------------------|-------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                                  |                         |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| S. G. Columbus Home Made                                         | Average of all analyses | 9                           | 13.36              | 6.57                    | 4.44                      | 10.01               | .36                 | 1.54               | 2.14             | 19.36                   |
|                                                                  | Guarantee               |                             |                    | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 19.31                   |
|                                                                  | Average of all analyses | 4                           | 12.63              | 5.36                    | 3.35                      | 8.70                | .31                 | 1.76               | 2.93             | 19.66                   |
|                                                                  | Guarantee               |                             |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | 1.65               | 4.00             | 18.51                   |
| S. G. Refuge German Kainit.                                      | Average of all analyses | 1                           | 5.67               |                         |                           |                     |                     |                    | 11.39            | 11.39                   |
|                                                                  | Guarantee               |                             |                    |                         |                           |                     |                     |                    | 12.44            | 12.44                   |
| <b>SHUBUTA OIL AND M'F'G. CO.,</b><br>Shubuta, Miss.             |                         |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Shubuta Acid Phosphate                                     | Average of all analyses | 1                           | 13.95              | 12.46                   | 4.90                      | 17.36               | .19                 |                    |                  | 16.87                   |
|                                                                  | Guarantee               |                             |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 15.70                   |
| S. G. Shubuta Mixture                                            | Average of all analyses | 1                           | 10.15              | 6.95                    | 4.18                      | 11.13               | .50                 | 1.83               | 2.18             | 21.78                   |
|                                                                  | Guarantee               |                             |                    | 6.00                    | 3.00                      | 9.00                | 1.00                | 1.65               | 1.60             | 18.21                   |
| <b>SOUTHERN OIL &amp; FERTILIZER COMPANY,</b><br>Meridian, Miss. |                         |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Acid Phosphate 16%                                         | Average of all analyses | 4                           | 13.80              | 14.79                   | 3.27                      | 18.06               | .21                 |                    |                  | 17.73                   |
|                                                                  | Guarantee               |                             |                    | 13.00                   | 3.00                      | 16.00               | 2.00                |                    |                  | 15.70                   |
| S. G. Cotton Grower                                              | Average of all analyses | 10                          | 12.31              | 8.93                    | 3.50                      | 12.43               | .39                 | 1.89               | 1.02             | 22.38                   |
|                                                                  | Guarantee               |                             |                    | 7.00                    | 3.00                      | 10.00               | 1.00                | 1.65               | 1.00             | 18.71                   |
| S. G. Rust Proof Guano.                                          | Average of all analyses | 5                           | 11.99              | 6.41                    | 2.74                      | 9.15                | .20                 | 1.12               | 4.30             | 18.86                   |
|                                                                  | Guarantee               |                             |                    | 5.00                    | 2.00                      | 7.00                | 2.00                | .83                | 5.00             | 16.03                   |

|                                                                                           |                               |    |       |       |      |       |      |      |       |       |
|-------------------------------------------------------------------------------------------|-------------------------------|----|-------|-------|------|-------|------|------|-------|-------|
| S. G. Superior Mixture .....                                                              | Average of all analyses ..... | 3  | 13.16 | 7.81  | 4.04 | 11.85 | 1.15 | 1.47 | 1.15  | 20.04 |
| S. G. German Kainit .....                                                                 | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 1.65 | 1.00  | 18.71 |
|                                                                                           | Average of all analyses ..... | 1  | 7.47  |       |      |       |      |      | 12.26 | 12.26 |
|                                                                                           | Guarantee.....                |    |       |       |      |       |      |      | 12.00 | 12.00 |
| <b>STANDARD GUANO &amp; CHEMICAL</b><br><b>M'F'G. COMPANY,</b><br><b>New Orleans, La.</b> |                               |    |       |       |      |       |      |      |       |       |
| H. G. Stern's Acid Phosphate<br>16% .....                                                 | Average of all analyses ..... | 2  | 14.10 | 13.27 | 3.30 | 16.57 | .37  |      |       | 16.24 |
|                                                                                           | Guarantee.....                |    |       | 14.00 | 2.00 | 16.00 | 1.00 |      |       | 15.80 |
| H. G. Stern's Acid Phosphate<br>14% .....                                                 | Average of all analyses ..... | 1  | 11.06 | 12.85 | 2.83 | 15.68 | .96  |      |       | 15.40 |
|                                                                                           | Guarantee.....                |    |       | 12.00 | 2.00 | 14.00 | 2.00 |      |       | 13.80 |
| S. G. Blood, Bone & Meat .....                                                            | Average of all analyses ..... | 2  | 14.33 | 5.57  | 4.39 | 9.96  | .58  | 2.09 | 1.80  | 21.20 |
|                                                                                           | Guarantee.....                |    |       | 7.00  | 2.50 | 9.50  | 1.00 | 1.65 | 1.50  | 18.71 |
| S. G. Boll Weevil Knockers<br>No. 2 .....                                                 | Average of all analyses ..... | 2  | 12.77 | 7.03  | 2.63 | 9.66  | .76  | 2.25 |       | 19.93 |
|                                                                                           | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 2.00 |       | 19.20 |
| S. G. Farmer's Choice .....                                                               | Average of all analyses ..... | 1  | 11.82 | 8.29  | 2.12 | 10.41 | .24  | 2.25 | 1.67  | 22.47 |
|                                                                                           | Guarantee.....                |    |       | 7.00  | 2.50 | 9.50  | 1.00 | 1.65 | 1.50  | 18.71 |
| S. G. Miss. Home Guano .....                                                              | Average of all analyses ..... | 3  | 17.68 | 5.44  | 2.15 | 7.59  | .16  | 1.72 | 1.75  | 17.19 |
|                                                                                           | Guarantee.....                |    |       | 7.00  | 2.50 | 9.50  | 1.00 | 1.65 | 1.50  | 18.71 |
| S. G. Stern's Am. R. B.<br>Superphosphate .....                                           | Average of all analyses ..... | 17 | 14.50 | 7.21  | 2.70 | 9.91  | .80  | 1.85 | 1.70  | 20.20 |
|                                                                                           | Guarantee.....                |    |       | 7.00  | 2.50 | 9.50  | 1.00 | 1.65 | 1.50  | 18.71 |
| <b>TENNESSEE VALLEY FERT. CO.</b><br><b>Florence, Ala.</b>                                |                               |    |       |       |      |       |      |      |       |       |
| Tiger H. G. Acid Phos-<br>phate 16% .....                                                 | Average of all analyses ..... | 3  | 12.93 | 12.89 | 3.83 | 16.72 | .72  |      |       | 16.34 |
|                                                                                           | Guarantee.....                |    |       | 12.00 | 4.00 | 16.00 | 2.00 |      |       | 15.60 |
| S. G. Blood & Bone .....                                                                  | Average of all analyses ..... | 4  | 12.00 | 7.48  | 4.06 | 11.54 | 1.88 | 1.85 | 1.41  | 21.56 |
|                                                                                           | Guarantee.....                |    |       | 8.00  | 2.00 | 10.00 | 2.00 | 1.65 | 1.50  | 19.31 |
| S. G. King Cotton Grower .....                                                            | Average of all analyses ..... | 8  | 14.85 | 7.55  | 2.83 | 10.38 | .98  | 1.74 | 1.37  | 19.90 |
|                                                                                           | Guarantee.....                |    |       | 8.00  | 2.00 | 10.00 | 2.00 | 1.65 | 1.00  | 18.81 |



TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                         |                                           | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|---------------------------------------------------------|-------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                         |                                           |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| O. G. Tiger Corn Grower .....                           | Average of all analyses<br>Guarantee..... | 2                           | 14.73              | 8.28                    | 3.61                      | 11.89               | 1.06                | 1.02               | 1.13             | 18.18                   |
| O. G. Tiger Cotton Grower .....                         | Average of all analyses<br>Guarantee..... | 2                           | 13.83              | 5.21                    | 2.18                      | 10.18               | 2.00                | .82                | 1.00             | 15.47                   |
| S. G. German Kainit .....                               | Average of all analyses<br>Guarantee..... | 1                           | 6.49               | 8.00                    | 2.18                      | 10.18               | 2.00                | .82                | 1.00             | 15.47                   |
| <b>THREEFOOT BROTHERS &amp; CO.,</b><br>Meridian, Miss. |                                           |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| Threefoot's H. G. English<br>Acid Phosphate .....       | Average of all analyses<br>Guarantee..... | 1                           | 15.29              | 15.24                   | 2.61                      | 17.85               | .03                 |                    |                  | 17.59                   |
| Threefoot's H. G. Improved<br>Mixture .....             | Average of all analyses<br>Guarantee..... | 2                           | 14.11              | 8.36                    | 3.48                      | 11.84               | .73                 | 1.64               | 1.86             | 21.51                   |
| <b>TUPELO FERTILIZER FACTORY,</b><br>Tupelo, Miss.      |                                           |                             |                    |                         |                           |                     |                     |                    |                  |                         |
| H. G. Cotton Belt Acid<br>Phosphate 16% .....           | Average of all analyses<br>Guarantee..... | 9                           | 16.32              | 12.08                   | 4.23                      | 16.31               | .61                 |                    |                  | 15.89                   |
| S. G. Cotton Belt Blood &<br>Bone .....                 | Average of all analyses<br>Guarantee..... | 6                           | 13.60              | 7.29                    | 4.45                      | 11.74               | .42                 | 1.68               | 1.64             | 21.25                   |
|                                                         |                                           |                             |                    | 7.00                    | 3.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 19.21                   |

|                                                              |                               |    |       |       |      |       |      |      |       |       |
|--------------------------------------------------------------|-------------------------------|----|-------|-------|------|-------|------|------|-------|-------|
| S. G. Cotton Belt Fertilizer .....                           | Average of all analyses ..... | 12 | 15.72 | 7.69  | 3.08 | 10.77 | .45  | 1.68 | 1.64  | 20.32 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 1.65 | 1.50  | 19.21 |
| S. G. Levi Phillips Mixture .....                            | Average of all analyses ..... | 1  | 15.77 | 6.94  | 2.95 | 9.89  | .22  | 1.68 | 1.53  | 19.25 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 1.65 | 1.50  | 19.21 |
| S. G. Tupelo Fertilizer .....                                | Average of all analyses ..... | 1  | 14.57 | 8.06  | 3.64 | 11.70 | .22  | 1.68 | 1.44  | 21.09 |
|                                                              | Guarantee.....                |    |       |       |      |       |      |      |       |       |
| H. G. Cotton Belt Fertilizer .....                           | Average of all analyses ..... | 1  | 15.14 | 8.28  | 2.57 | 10.85 | .56  | 1.68 | 2.14  | 20.96 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 1.00 | 1.65 | 1.71  | 19.71 |
| S. G. Tupelo German Kainit .....                             | Average of all analyses ..... | 3  | 1.24  |       |      |       |      |      | 14.45 | 14.45 |
|                                                              | Guarantee.....                |    |       |       |      |       |      |      | 12.00 | 12.00 |
| <b>VIRGINIA-CAROLINA CHEMICAL COMPANY,</b><br>Memphis, Tenn. |                               |    |       |       |      |       |      |      |       |       |
| S. G. I. X. L. Acid Phosphate .....                          | Average of all analyses ..... | 2  | 12.04 | 9.84  | 2.90 | 12.74 | .55  |      |       | 12.45 |
|                                                              | Guarantee.....                |    |       | 8.50  | 3.50 | 12.00 | 2.00 |      |       | 11.65 |
| S. G. Royal Acid Phosphate .....                             | Average of all analyses ..... | 1  | 12.69 | 8.37  | 4.77 | 13.14 | .14  |      |       | 12.66 |
|                                                              | Guarantee.....                |    |       | 8.50  | 3.50 | 12.00 | 2.00 |      |       | 11.65 |
| H. G. Mobile Superphosphate .....                            | Average of all analyses ..... | 1  | 16.12 | 12.72 | 3.86 | 16.58 | .97  |      |       | 16.19 |
|                                                              | Guarantee.....                |    |       | 11.50 | 4.50 | 16.00 | 2.00 |      |       | 15.55 |
| Scott's H. G. Acid Phosphate .....                           | Average of all analyses ..... | 1  | 12.04 | 10.33 | 4.82 | 15.15 | .38  |      |       | 14.67 |
|                                                              | Guarantee.....                |    |       | 10.00 | 4.00 | 14.00 | 2.00 |      |       | 13.60 |
| H. G. V. C. Superphosphate .....                             | Average of all analyses ..... | 9  | 14.36 | 13.00 | 3.98 | 16.98 | .51  |      |       | 16.58 |
|                                                              | Guarantee.....                |    |       | 11.50 | 4.50 | 16.00 | 2.00 |      |       | 15.55 |
| S. G. Boll Weevil Victor .....                               | Average of all analyses ..... | 1  | 10.07 | 7.58  | 2.58 | 10.16 | .65  | 2.06 | .61   | 20.28 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 2.00 | 1.65 | .35   | 18.06 |
| S. G. Buck's Best .....                                      | Average of all analyses ..... | 2  | 12.41 | 7.99  | 2.83 | 10.82 | .70  | 1.69 | 1.74  | 20.55 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 2.00 | 1.65 | 1.50  | 19.21 |
| S. G. Eclipse Soluble Guano .....                            | Average of all analyses ..... | 1  | 11.89 | 7.18  | 3.65 | 10.83 | .66  | 1.90 | 1.40  | 21.02 |
|                                                              | Guarantee.....                |    |       | 6.50  | 3.00 | 9.50  | 2.00 | 1.65 | 1.00  | 18.16 |
| S. G. Mobile Double Eagle Guano .....                        | Average of all analyses ..... | 18 | 12.06 | 7.75  | 2.95 | 10.70 | .71  | 1.77 | 1.76  | 20.75 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 2.00 | 1.65 | 1.50  | 19.21 |
| S. G. Mobile R. B. Am. Superphosphate .....                  | Average of all analyses ..... | 5  | 9.94  | 6.85  | 3.69 | 10.54 | .88  | 1.75 | 1.68  | 20.35 |
|                                                              | Guarantee.....                |    |       | 7.00  | 3.00 | 10.00 | 2.00 | 1.65 | 1.50  | 19.21 |
| S. G. Mobile Standard Guano .....                            | Average of all analyses ..... | 3  | 9.64  | 5.88  | 3.43 | 9.31  | .96  | 1.74 | 2.59  | 19.89 |
|                                                              | Guarantee.....                |    |       | 6.00  | 2.50 | 8.50  | 2.00 | 1.65 | 2.00  | 18.11 |

TABLE IV.—Average Composition of Fertilizers Analyzed during Season 1910-1911.

| Name of Brand and Manufacturer.                | Number of Samples Averaged. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|------------------------------------------------|-----------------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                                                |                             |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| H. G. Pelican Truck Grower & Top Dresser ..... | 1                           | 13.48              | 3.16<br>6.00            | 6.43<br>2.00              | 9.59<br>8.00        | 1.76<br>2.00        | 3.83<br>4.15       | 4.76<br>5.00     | 30.94<br>31.24          |
| S. G. Richmond Double Eagle Guano .....        | 3                           | 11.58              | 8.34<br>7.00            | 2.70<br>3.00              | 11.04<br>10.00      | .89<br>2.00         | 1.70<br>1.65       | 1.60<br>1.50     | 20.70<br>19.21          |
| S. G. Royal Blood, Bone & Potash .....         | 6                           | 11.74              | 7.03<br>7.00            | 3.52<br>3.00              | 10.55<br>10.00      | .84<br>2.00         | 1.71<br>1.65       | 1.71<br>1.50     | 20.23<br>19.21          |
| H. G. Royal Vegetable Fertilizer .....         | 1                           | 11.98              | 5.60<br>6.00            | 2.49<br>2.00              | 8.09<br>8.00        | .41<br>2.00         | 2.65<br>2.47       | 4.04<br>4.00     | 23.95<br>23.10          |
| S. G. Scott's Gossypium Phospho .....          | 17                          | 12.58              | 7.74<br>7.00            | 3.02<br>3.00              | 10.76<br>10.00      | .75<br>2.00         | 1.81<br>1.65       | 1.68<br>1.50     | 20.90<br>19.21          |
| S. G. Scott's State Standard Guano .....       | 1                           | 13.26              | 6.47<br>6.00            | 2.59<br>2.50              | 9.06<br>8.50        | .43<br>2.00         | 1.81<br>1.65       | 2.38<br>2.00     | 19.78<br>18.11          |
| S. G. Victor Am. Bone Superphosphate .....     | 2                           | 9.31               | 7.14<br>7.00            | 4.41<br>3.00              | 11.55<br>10.00      | .69<br>2.00         | 1.70<br>1.65       | 1.51<br>1.50     | 21.00<br>19.21          |
| H. G. Victor Guano .....                       | 2                           | 13.91              | 7.68<br>7.00            | 4.83<br>3.00              | 12.51<br>10.00      | 1.21<br>2.00        | 2.48<br>3.30       | 1.26<br>1.50     | 25.07<br>26.23          |
| S. G. V. C. C. Standard Guano .....            | 2                           | 13.17              | 8.24<br>7.00            | 2.95<br>3.00              | 11.19<br>10.00      | .89<br>2.00         | 1.97<br>1.65       | 1.75<br>1.50     | 22.13<br>19.21          |

| WESSON COTTON OIL & FERT.<br>COMPANY,<br>Wesson, Miss. |                               |   |       |       |      |       |      |      |      |       |       |
|--------------------------------------------------------|-------------------------------|---|-------|-------|------|-------|------|------|------|-------|-------|
| H. G. Acid Phosphate 16%.....                          | Average of all analyses ..... | 1 | 13.70 | 12.83 | 3.81 | 16.64 | .51  |      |      |       | 16.26 |
|                                                        | Guarantee.....                |   |       | 14.00 | 2.00 | 16.00 | 1.00 |      |      |       | 15.80 |
| S. G. Mutual Friend<br>Mixture .....                   | Average of all analyses ..... | 2 | 12.49 | 7.99  | 2.81 | 10.80 | .55  | 1.81 | 1.96 | 21.25 |       |
|                                                        | Guarantee.....                |   |       | 7.00  | 2.00 | 9.00  | 1.00 | 1.65 | 1.75 | 18.46 |       |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                         | Where and from Whom Collected.                         |
|--------------------|-------------------------------------------------------------------------|--------------------------------------------------------|
|                    | <b>ARMOUR FERTILIZER WORKS,</b><br>New Orleans, La.                     |                                                        |
| 17372              | Armour's S. G. King Cotton .....                                        | W. H. Hurt, Kilmichael .....<br>Guarantee.....         |
|                    | <b>BIRMINGHAM FERTILIZER CO.,</b><br>Birmingham, Ala.                   |                                                        |
| 18115              | H. G. Monarch Acid Phosphate 16% .....                                  | Aberdeen Hardware Co., Aberdeen ....<br>Guarantee..... |
|                    | <b>BROOKHAVEN COTTON OIL &amp; FERTILIZER CO.,</b><br>Brookhaven, Miss. |                                                        |
| 18058              | S. G. Cotton Tail.....                                                  | Louis Cohn & Bro., Brookhaven .....<br>Guarantee.....  |
|                    | <b>CANTON OIL MILL COMPANY,</b><br>Canton, Miss.                        |                                                        |
| 18063              | H. G. Paragon .....                                                     | C. W. Bacon, Vaiden .....<br>Guarantee.....            |
|                    | <b>CAPITAL FERTILIZER &amp; M'F'G. COMPANY.</b><br>Jackson, Miss.       |                                                        |
| 18048              | Extra H. G. Acid Phosphate 16%.....                                     | W. G. Barnes, Brandon .....                            |
| 18062              | Extra H. G. Acid Phosphate 16%.....                                     | G. W. Stigler, Lexington .....<br>Guarantee.....       |
| 18119              | H. G. Acid Phosphate 14%.....                                           | E. M. Carter, Centerville.....<br>Guarantee.....       |
| 18045              | S. G. Capital Early Producer .....                                      | Ross Bros. & Summer, Pelahatchie ..<br>Guarantee.....  |
| *18034             | S. G. Nonpareil .....                                                   | Lee Sansing, Newton .....                              |
| *19115             | S. G. Nonpareil .....                                                   | Lee Sansing, Newton .....                              |
| 18059              | S. G. Nonpareil .....                                                   | Max Priebatsch, Brookhaven .....                       |
| 18139              | S. G. Nonpareil .....                                                   | Florence Merc. Co., Florence.....                      |
| 18140              | S. G. Nonpareil .....                                                   | W. M. Prine, Weathersby .....                          |
| 18154              | S. G. Nonpareil .....                                                   | Holloway & McRaney, Collins .....<br>Guarantee.....    |
| 18061              | S. G. Red Star Brand Guano .....                                        | T. S. Turner, Canton .....<br>Guarantee.....           |

\* Samples Nos. 18034 and 19115 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |                        | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value<br>Per Ton. |
|--------------------|--------------------|----------------------------|------------------------------|------------------------|------------------------|--------------------|------------------|----------------------------|
|                    |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. | Insoluble<br>Per Cent. |                    |                  |                            |
| 17372              | 11.87              | 6.75<br>6.00               | 2.70<br>2.35                 | 9.45<br>8.35           | 1.17<br>.50            | 1.69<br>1.65       | 2.20<br>2.00     | 19.51<br>17.96             |
| 18115              | 12.41              | 9.45<br>14.00              | 5.60<br>2.00                 | 15.05<br>16.00         | .57<br>2.00            |                    |                  | 14.49<br>15.80             |
| 18058              | 7.68               | 7.35<br>7.50               | 4.27<br>2.50                 | 11.62<br>10.00         | .13<br>1.00            | 2.10<br>2.00       | .58<br>.25       | 21.86<br>19.50             |
| 18063              | 11.06              | 9.69<br>8.00               | 1.80<br>4.00                 | 11.49<br>12.00         | 1.33<br>1.00           | 2.05<br>2.00       | .59<br>.50       | 21.76<br>21.80             |
| 18048              | 13.67              | 11.10                      | 4.92                         | 16.02                  | .48                    |                    |                  | 15.53                      |
| 18062              | 13.72              | 10.32<br>12.00             | 6.16<br>4.00                 | 16.48<br>16.00         | .20<br>1.00            |                    |                  | 15.86<br>15.60             |
| 18119              | 12.58              | 11.12<br>10.00             | 2.90<br>4.00                 | 14.02<br>14.00         | .11<br>1.00            |                    |                  | 13.73<br>13.60             |
| 18045              | 10.40              | 7.78<br>6.50               | 3.25<br>3.00                 | 11.03<br>9.50          | .46<br>1.00            | 2.10<br>2.00       | .55<br>.50       | 21.28<br>19.15             |
| 18034              | 11.25              | 7.78                       | 1.56                         | 9.34                   | .48                    | 1.34               | 2.12             | 17.93                      |
| 19115              | 14.94              | 7.04                       | 2.46                         | 9.50                   | .47                    | 1.47               | 2.19             | 18.64                      |
| 18059              | 10.23              | 6.06                       | 3.30                         | 9.36                   | .32                    | 1.65               | 2.08             | 19.06                      |
| 18139              | 11.06              | 6.48                       | 3.19                         | 9.67                   | .24                    | 1.53               | 2.14             | 18.96                      |
| 18140              | 10.82              | 7.16                       | 2.68                         | 9.84                   | .18                    | 1.67               | 2.09             | 19.74                      |
| 18154              | 13.91              | 6.74<br>6.50               | 2.51<br>2.50                 | 9.25<br>9.00           | .24<br>1.00            | 1.53<br>1.65       | 2.00<br>2.00     | 18.43<br>18.66             |
| 18061              | 11.44              | 6.14<br>6.50               | 3.26<br>2.50                 | 9.40<br>9.00           | .42<br>1.00            | 1.55<br>1.65       | 2.37<br>2.00     | 18.97<br>18.66             |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                                             | Where and from Whom Collected.                         |
|--------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------|
|                    | <b>CRYSTAL SPRINGS OIL MILL,<br/>FERT. &amp; M'F'G. COMPANY.<br/>Crystal Springs, Miss.</b> |                                                        |
| 18054              | H. G. Crystal Vegetable Grower                                                              | Lotterhos & Huber Co., Crystal Sp'gs<br>Guarantee..... |
|                    | <b>A. H. GEORGE &amp; COMPANY,<br/>Meridian, Miss.</b>                                      |                                                        |
| *18037             | S. G. George's Cotton King .....                                                            | McMullen & Sons, Hickory .....                         |
| *18504             | S. G. George's Cotton King .....                                                            | McMullen & Sons, Hickory .....                         |
|                    | <b>GERMAN KALI WORKS,<br/>Baltimore, Md.</b>                                                |                                                        |
| 18038              | S. G. German Kainit .....                                                                   | W. H. Gallaspy Sons Co., Hickory ....                  |
| 18108              | S. G. German Kainit .....                                                                   | Bramlitt Hardware Co., Corinth .....                   |
|                    | <b>GREAT SOUTHERN PHOSPHATE<br/>COMPANY,<br/>Mt. Pleasant, Tenn.</b>                        |                                                        |
| 18084              | H. G. Great Southern Special<br>Acid Phosphate .....                                        | Farmers Warehouse Co., Calhoun City                    |
| 18146              | H. G. Great Southern Special<br>Acid Phosphate .....                                        | Farmers Wareh'se Co., Taylorsville<br>Guarantee.....   |
| 18032              | H. G. Best by Test .....                                                                    | Hardy Wally, Richton .....                             |
| 18113              | H. G. Best by Test .....                                                                    | Farmers Warehouse Co., Kilmichae                       |
| 18145              | H. G. Best by Test .....                                                                    | Farmers Warehouse Co., Taylorsville<br>Guarantee.....  |
| 18083              | S. G. Farmers Favorite .....                                                                | Farmers Warehouse Co., Calhoun City                    |
| 18147              | S. G. Farmers Favorite .....                                                                | Farmers Warehouse Co., Taylorsville                    |
| 18158              | S. G. Farmers Favorite .....                                                                | Farmers Warehouse Co., Seminary....<br>Guarantee.....  |
| 18106              | H. G. The General Lee Cotton                                                                | Farmers Warehouse Co., Iuka .....                      |
| 18151              | O. G. The Planters Champion...                                                              | Farmers Warehouse Co., Mize .....                      |
| †18082             | H. G. The Boys Corn Club<br>Special .....                                                   | Farmers Warehouse Co., Calhoun City                    |
| †18507             | H. G. The Boys Corn Club<br>Special .....                                                   | Farmers Warehouse Co., Calhoun City<br>Guarantee.....  |
| †18157             | S. G. Universal Cotton Grower                                                               | Farmers Warehouse Co., Seminary ....                   |
| †19121             | S. G. Universal Cotton Grower                                                               | Farmers Warehouse Co., Seminary ....<br>Guarantee..... |

\* Samples Nos. 18037 and 18504 were drawn from the same shipment.

† Samples Nos. 18082 and 18507 were drawn from the same shipment.

‡ Samples Nos. 18157 and 19121 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 18054              | 10.54              | 5.40<br>4.00            | 2.89<br>1.50              | 8.29<br>5.50        | .34<br>.25          | 2.77<br>3.00       | 4.34<br>4.00     | 24.94<br>22.65          |
| 18037              | 12.38              | 5.93                    | 2.93                      | 8.86                | .74                 | 1.17               | 1.90             | 16.33                   |
| 18504              | 13.83              | 5.42<br>8.00            | 3.29<br>2.00              | 8.71<br>10.00       | .69<br>2.00         | 1.17<br>1.50       | 1.96<br>2.00     | 16.18<br>19.18          |
| 18038              | 5.32               |                         |                           |                     |                     |                    | 13.14            | 13.14                   |
| 18108              | 6.07               |                         |                           |                     |                     |                    | 12.76<br>12.00   | 12.76<br>12.00          |
| 18084              | 12.75              | 12.02                   | 5.26                      | 17.28               | .47                 |                    |                  | 16.75                   |
| 18146              | 15.48              | 11.42<br>14.00          | 4.83<br>2.00              | 16.25<br>16.00      | .69<br>2.00         |                    |                  | 15.77<br>15.80          |
| 18032              | 9.54               | 5.23                    | 4.80                      | 10.03               | 6.11                | 1.61               | 1.99             | 19.39                   |
| 18113              | 5.37               | 6.80                    | 5.08                      | 11.88               | 4.99                | 1.49               | 2.06             | 20.95                   |
| 18145              | 11.25              | 6.83<br>7.00            | 3.61<br>3.00              | 10.44<br>10.00      | 5.32<br>5.00        | 1.66<br>1.65       | 2.46<br>2.00     | 20.64<br>19.71          |
| 18083              | 10.50              | 5.52                    | 5.10                      | 10.62               | 4.55                | 1.84               | 1.14             | 20.13                   |
| 18174              | 10.04              | 4.76                    | 6.35                      | 11.11               | 5.84                | 1.60               | 1.48             | 19.87                   |
| 18158              | 8.24               | 5.13<br>7.00            | 4.91<br>3.00              | 10.04<br>10.00      | 8.23<br>5.00        | 1.52<br>1.65       | 1.29<br>1.00     | 18.30<br>18.71          |
| 18106              | 10.45              | 6.94<br>8.00            | 4.59<br>3.00              | 11.53<br>11.00      | 3.33<br>5.00        | 1.49<br>1.65       | 1.41<br>1.00     | 19.97<br>19.81          |
| 18151              | 10.47              | 6.59<br>7.00            | 4.07<br>3.18              | 10.66<br>10.18      | 7.73<br>5.00        | .86<br>.82         | .80<br>1.00      | 15.77<br>15.37          |
| 18082              | 10.02              | 4.38                    | 4.55                      | 8.93                | 7.14                | 1.69               | 1.92             | 18.47                   |
| 18507              | 8.38               | 4.22<br>6.00            | 4.00<br>2.00              | 8.22<br>8.00        | 8.85<br>2.00        | 1.41<br>2.46       | 2.24<br>2.00     | 16.87<br>21.06          |
| 18157              | 8.81               | 5.01                    | 4.72                      | 9.73                | 8.05                | 1.35               | 1.64             | 17.61                   |
| 19121              | 9.58               | 5.33<br>6.00            | 5.02<br>2.35              | 10.35<br>8.35       | 7.60<br>5.00        | 1.37<br>1.65       | 1.56<br>2.00     | 18.27<br>17.96          |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                                         | Name of Brand and Manufacturer.           | Where and from Whom Collected.              |
|----------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------|
| <b>GULFPORT FERT. &amp; M'F'G. CO.,<br/>Gulfport, Miss.</b>                |                                           |                                             |
| *18126                                                                     | S. G. Primo R. B. Super-phosphate .....   | J. W. Simmons Sons Co., Osyka.....          |
| *19118                                                                     | S. G. Primo R. B. Super-phosphate .....   | J. W. Simmons Sons Co., Osyka.....          |
| 18153                                                                      | S. G. Primo R. B. Super-phosphate .....   | W. P. Bryant, Mize .....                    |
|                                                                            |                                           | Guarantee.....                              |
| <b>HAZLEHURST OIL MILL &amp; FERTILIZER COMPANY,<br/>Hazlehurst, Miss.</b> |                                           |                                             |
| †18168                                                                     | H. G. Acid Phosphate 16% .....            | Ginn-McDonald Co., Tylertown .....          |
| †19340                                                                     | H. G. Acid Phosphate 16% .....            | Ginn-McDonald Co., Tylertown .....          |
|                                                                            |                                           | Guarantee.....                              |
| 18056                                                                      | S. G. Imperial Fertilizer .....           | R. L. Davis, Brookhaven .....               |
| 18120                                                                      | S. G. Imperial Fertilizer .....           | Ginn-McDonald Co., Tylertown .....          |
|                                                                            |                                           | Guarantee.....                              |
| <b>JACKSON FERTILIZER COMPANY,<br/>Jackson, Miss.</b>                      |                                           |                                             |
| 18041                                                                      | H. G. Red Band Acid Phosphate .....       | Forest Merc. Co., Forest .....              |
| 18118                                                                      | H. G. Red Band Acid Phosphate .....       | Centreville Merc. Co., Centreville .....    |
| 18128                                                                      | H. G. Red Band Acid Phosphate .....       | W. H. Bates, Liberty .....                  |
| 18136                                                                      | H. G. Red Band Acid Phosphate .....       | F. L. Riley Merc. Co., Newhebron .....      |
|                                                                            |                                           | Guarantee.....                              |
| 18144                                                                      | S. G. Chicago R. B. Super-phosphate ..... | Risher-Ruffin Co., Taylorsville .....       |
|                                                                            |                                           | Guarantee.....                              |
| 18053                                                                      | H. G. Blue Ribbon Peanut Grower .....     | Lotterhos & Huber, Crystal Springs....      |
| 18163                                                                      | H. G. Blue Ribbon Peanut Grower .....     | W. D. Johns & Co., Gloster.....             |
|                                                                            |                                           | Guarantee.....                              |
| 18129                                                                      | H. G. Nitrate of Soda .....               | Lampton Merc. Co., Magnolia .....           |
|                                                                            |                                           | Guarantee.....                              |
| 18060                                                                      | S. G. Royal "C" Brand .....               | A. C. Seavey & Sons, Brookhaven ....        |
| 18064                                                                      | S. G. Royal "C" Brand .....               | J. W. McLarty & Co., Water Valley .....     |
| 18067                                                                      | S. G. Royal "C" Brand .....               | Armstrong & Bailey Bros., Coffeeville ..... |
| 18124                                                                      | S. G. Royal "C" Brand .....               | Lampton Bros., Co., Tylertown .....         |
| 18143                                                                      | S. G. Royal "C" Brand .....               | Risher-Ruffin Co., Taylorsville .....       |
| 18155                                                                      | S. G. Royal "C" Brand .....               | The Lampton & Rawls Co., Mt. Olive .....    |
|                                                                            |                                           | Guarantee.....                              |

\* Samples Nos. 18126 and 19118 were drawn from the same shipment.

† Samples Nos. 18168 and 19340 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.           |                              |                        |                        | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value<br>Per Ton. |
|--------------------|--------------------|----------------------------|------------------------------|------------------------|------------------------|--------------------|------------------|----------------------------|
|                    |                    | Water Soluble<br>Per Cent. | Citrate Soluble<br>Per Cent. | Available<br>Per Cent. | Insoluble<br>Per Cent. |                    |                  |                            |
| 18126              | 10.72              | 5.93                       | 2.85                         | 8.78                   | 1.91                   | 1.34               | 2.29             | 17.36                      |
| 19118              | 11.22              | 5.40                       | 3.37                         | 8.77                   | 2.26                   | 1.49               | 2.23             | 17.87                      |
| 18153              | 11.59              | 4.77                       | 4.35                         | 9.12                   | .19                    | 1.99               | 1.42             | 19.47                      |
|                    |                    | 7.00                       | 2.00                         | 9.00                   | 1.00                   | 1.65               | 2.00             | 18.71                      |
| 18168              | 16.21              | 8.61                       | 5.60                         | 14.21                  | .97                    |                    |                  | 13.65                      |
| 19340              | 16.91              | 9.10                       | 4.21                         | 13.31                  | 1.81                   |                    |                  | 12.89                      |
|                    |                    | 14.00                      | 2.00                         | 16.00                  | 1.00                   |                    |                  | 15.80                      |
| 18056              | 10.45              | 8.61                       | 2.54                         | 11.15                  | .22                    | 1.70               | 1.77             | 21.01                      |
| 18120              | 12.25              | 8.06                       | 2.87                         | 10.93                  | .26                    | 1.66               | 1.89             | 20.68                      |
|                    |                    | 7.00                       | 2.00                         | 9.00                   | 1.00                   | 1.65               | 1.75             | 18.46                      |
| 18041              | 14.69              | 13.19                      | 4.06                         | 17.25                  | .38                    |                    |                  | 16.84                      |
| 18118              | 12.20              | 12.79                      | 4.64                         | 17.43                  | .26                    |                    |                  | 16.97                      |
| 18128              | 13.57              | 12.60                      | 3.87                         | 16.47                  | .45                    |                    |                  | 16.08                      |
| 18136              | 13.72              | 12.82                      | 3.95                         | 16.77                  | .51                    |                    |                  | 16.38                      |
|                    |                    | 14.00                      | 2.00                         | 16.00                  | 1.00                   |                    |                  | 15.80                      |
| 18144              | 13.72              | 5.38                       | 4.16                         | 9.54                   | .28                    | 1.84               | 1.63             | 19.53                      |
|                    |                    | 7.50                       | 2.00                         | 9.50                   | 1.00                   | 1.65               | 1.50             | 18.76                      |
| 18053              | 10.75              | 5.52                       | 3.71                         | 9.23                   | .55                    | 1.02               | 4.03             | 18.15                      |
| 18163              | 12.81              | 5.61                       | 3.45                         | 9.06                   | .45                    | 1.03               | 4.01             | 18.01                      |
|                    |                    | 7.00                       | 2.00                         | 9.00                   | 1.00                   | 1.00               | 4.00             | 17.95                      |
| 18129              | 2.43               |                            |                              |                        |                        | 15.36              |                  | 65.28                      |
|                    |                    |                            |                              |                        |                        | 15.00              |                  | 63.75                      |
| 18060              | 12.73              | 6.85                       | 3.11                         | 9.96                   | .27                    | 1.65               | 1.99             | 19.65                      |
| 18064              | 12.99              | 7.35                       | 2.86                         | 10.21                  | .26                    | 1.83               | 2.04             | 20.76                      |
| 18067              | 12.50              | 6.49                       | 2.98                         | 9.47                   | .32                    | 1.73               | 2.20             | 19.67                      |
| 18124              | 14.60              | 6.71                       | 2.49                         | 9.20                   | .31                    | 1.82               | 1.86             | 19.47                      |
| 18143              | 15.27              | 6.19                       | 3.40                         | 9.59                   | .11                    | 1.68               | 2.04             | 19.39                      |
| 18155              | 13.58              | 6.01                       | 3.48                         | 9.49                   | .48                    | 1.65               | 1.81             | 18.91                      |
|                    |                    | 8.50                       | 1.25                         | 9.75                   | 1.00                   | 1.65               | 1.80             | 19.41                      |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number.                                               | Name of Brand and Manufacturer.                      | Where and from Whom Collected.                         |
|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|
| <b>LAUREL OIL &amp; FERTILIZER CO.,<br/>Laurel, Miss.</b>        |                                                      |                                                        |
| 18161                                                            | H. G. Acid Phosphate 16%.....                        | Hudson & Co., Sumrall .....<br>Guarantee.....          |
| 18148                                                            | S. G. K. C. Ammoniated Bone                          | E. B. Perry, Taylorsville .....<br>Guarantee.....      |
| 18137                                                            | S. G. Meal & Phosphate<br>Mixture .....              | J. J. Berry, Newhebron .....                           |
| 18149                                                            | S. G. Meal & Phosphate<br>Mixture.....               | E. B. Perry, Taylorsville .....<br>Guarantee.....      |
| 18021                                                            | S. G. Plow Brand .....                               | Abney & Travis, Heidelberg .....                       |
| 18029                                                            | S. G. Plow Brand .....                               | Premium Merc. Co., Merrill .....                       |
| 18160                                                            | S. G. Plow Brand .....                               | McLain King Co., Bassfield .....<br>Guarantee.....     |
| <b>LOTTERHOS &amp; HUBER COMPANY,<br/>Crystal Springs, Miss.</b> |                                                      |                                                        |
| 18055                                                            | O. G. Pomace .....                                   | Lotterhos & Huber Co., Crystal Sp'gs                   |
| 18164                                                            | O. G. Pomace .....                                   | Lotterhos & Huber Co., Crystal Sp'gs<br>Guarantee..... |
| <b>MERIDIAN FERTILIZER FACTORY,<br/>Meridian Miss.</b>           |                                                      |                                                        |
| 18042                                                            | H. G. Meridian Union Special<br>Acid Phosphate ..... | Loper Merc. Co., Lake .....                            |
| 18101                                                            | H. G. Meridian Union Special<br>Acid Phosphate ..... | Phillips, Reinhart Taylor Co., Boonv'e                 |
| 18112                                                            | H. G. Meridian Union Special<br>Acid Phosphate ..... | T. W. Ford & Co., Eupora .....<br>Guarantee.....       |
| *18023                                                           | S. G. Meridian Blood & Bone ..                       | Hicks Merc. Co., Laurel .....                          |
| *18502                                                           | S. G. Meridian Blood & Bone ..                       | Hicks Merc. Co., Laurel .....                          |
| †19338                                                           | S. G. Meridian Blood & Bone ..                       | Bonds, Youngblood & Co., Bladwyn..                     |
| †18098                                                           | S. G. Meridian Blood & Bone ..                       | Bonds, Youngblood & Co., Baldwyn..                     |
| 18138                                                            | S. G. Meridian Blood & Bone ..                       | D. C. Griffith & Co., Silver Creek.....                |
| 18156                                                            | S. G. Meridian Blood & Bone ..                       | R. Watts & Co., Seminary .....<br>Guarantee.....       |
| 18024                                                            | H. G. Dried Blood .....                              | Kennedy & Co., Wiggins .....<br>Guarantee.....         |
| 18030                                                            | S. G. Meridian Home Mixture ..                       | Lucedale Com. Co., Lucedale .....                      |
| 18057                                                            | S. G. Meridian Home Mixture ..                       | John McGrath & Sons, Brookhaven ..                     |
| 18086                                                            | S. G. Meridian Home Mixture ..                       | L. C. Smith, Houston .....                             |
| 18097                                                            | S. G. Meridian Home Mixture ..                       | Bonds, Youngblood & Co., Baldwyn..                     |
| 18107                                                            | S. G. Meridian Home Mixture ..                       | W. W. Harris & Co., Iuka .....                         |
| 18114                                                            | S. G. Meridian Home Mixture ..                       | A. E. Dalrymple & Sons, Amory .....                    |
| 18135                                                            | S. G. Meridian Home Mixture ..                       | The Rankin Co., Columbia .....                         |
| 18150                                                            | S. G. Meridian Home Mixture ..                       | H. H. Little & Co., Mize .....                         |

\*] Samples Nos. 18023 and 18502 were drawn from the same shipment.

† Samples Nos. 19338 and 18098 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                       |                     | Nitrogen—Per Cent.  | Potash—Per Cent.    | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|-----------------------|---------------------|---------------------|---------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent.   | Insoluble Per Cent. |                     |                     |                         |
| 18161              | 13.68              | 10.86<br><i>12.00</i>   | 5.89<br><i>4.00</i>       | 16.75<br><i>16.00</i> | .65<br><i>2.00</i>  |                     |                     | 16.16<br><i>15.60</i>   |
| 18148              | 9.53               | 7.73<br><i>8.00</i>     | 3.11<br><i>1.50</i>       | 10.84<br><i>9.50</i>  | 6.91<br><i>2.00</i> | 1.31<br><i>1.40</i> | 1.33<br><i>1.50</i> | 18.51<br><i>17.75</i>   |
| 18137              | 11.16              | 7.70                    | 3.57                      | 11.27                 | .69                 | 2.37                | .65                 | 22.76                   |
| 18149              | 9.33               | 6.34<br><i>7.50</i>     | 4.89<br><i>2.00</i>       | 11.23<br><i>9.50</i>  | .83<br><i>2.00</i>  | 2.14<br><i>2.00</i> | .64<br><i>.50</i>   | 21.60<br><i>19.25</i>   |
| 18021              | 12.07              | 7.48                    | 2.78                      | 10.26                 | 2.39                | 1.70                | 1.73                | 19.96                   |
| 18029              | 11.28              | 6.86                    | 3.11                      | 9.97                  | 2.63                | 1.67                | 1.50                | 19.25                   |
| 18160              | 12.54              | 6.80<br><i>7.50</i>     | 3.76<br><i>2.00</i>       | 10.56<br><i>9.50</i>  | 3.24<br><i>2.00</i> | 1.69<br><i>1.65</i> | 1.75<br><i>1.50</i> | 20.17<br><i>18.76</i>   |
| 18055              | 9.14               |                         |                           |                       | 1.76                | 4.40                | .94                 | 20.52                   |
| 18164              | 10.18              |                         |                           |                       | 2.00<br><i>1.50</i> | 4.62<br><i>4.50</i> | 1.03<br><i>.50</i>  | 21.67<br><i>20.38</i>   |
| 18042              | 12.52              | 11.24                   | 4.75                      | 15.99                 | .87                 |                     |                     | 15.52                   |
| 18101              | 12.38              | 12.25                   | 4.72                      | 16.97                 | .13                 |                     |                     | 16.50                   |
| 18112              | 9.93               | 12.85<br><i>13.00</i>   | 4.81<br><i>3.00</i>       | 17.66<br><i>16.00</i> | .10<br><i>1.00</i>  |                     |                     | 17.18<br><i>15.70</i>   |
| 18023              | 11.25              | 7.79                    | 3.98                      | 11.77                 | .91                 | 1.38                | 2.16                | 20.57                   |
| 18502              | 11.26              | 7.18                    | 3.61                      | 10.79                 | 1.39                | 1.53                | 2.36                | 20.36                   |
| 19338              | 12.37              | 6.48                    | 4.56                      | 11.04                 | 2.25                | 1.55                | 1.02                | 19.30                   |
| 18098              | 13.45              | 6.59                    | 4.42                      | 11.01                 | 2.05                | 1.54                | .94                 | 19.15                   |
| 18138              | 11.56              | 7.08                    | 3.79                      | 10.87                 | 1.29                | 1.80                | 1.75                | 20.98                   |
| 18156              | 11.45              | 6.84<br><i>7.00</i>     | 3.67<br><i>3.00</i>       | 10.51<br><i>10.00</i> | 1.62<br><i>1.00</i> | 1.93<br><i>1.65</i> | 1.71<br><i>1.50</i> | 21.11<br><i>19.21</i>   |
| 18024              | 9.91               |                         |                           |                       |                     | 12.98               |                     | 55.17                   |
| 18030              | 11.82              | 8.10                    | 3.36                      | 11.46                 | .89                 | 1.60                | 1.71                | 20.78                   |
| 18057              | 12.50              | 8.92                    | 3.40                      | 12.32                 | .64                 | 1.73                | 1.66                | 22.22                   |
| 18086              | 12.70              | 6.94                    | 4.02                      | 10.96                 | .77                 | 1.65                | 1.63                | 20.30                   |
| 18097              | 12.85              | 7.87                    | 3.80                      | 11.67                 | 1.79                | 1.82                | 1.30                | 21.49                   |
| 18107              | 11.74              | 7.95                    | 3.58                      | 11.53                 | .88                 | 1.67                | 1.23                | 20.65                   |
| 18114              | 10.71              | 7.22                    | 3.65                      | 10.87                 | 1.81                | 1.86                | 1.41                | 20.91                   |
| 18135              | 13.09              | 7.36                    | 3.30                      | 10.66                 | 1.01                | 1.73                | 1.85                | 20.60                   |
| 18150              | 12.30              | 7.36                    | 3.86                      | 11.22                 | 1.21                | 1.52                | 1.50                | 19.92                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                              | Where and from Whom Collected.       |
|--------------------|--------------------------------------------------------------|--------------------------------------|
| 18159              | S. G. Meridian Home Mixture ..                               | S. S. Dale & Sons, Prentiss .....    |
| 18162              | S. G. Meridian Home Mixture ..                               | Sumrall Merc. Co., Sumrall .....     |
| 18169              | S. G. Meridian Home Mixture ..                               | John McGrath & Sons, Brookhaven ..   |
|                    | <b>MISSISSIPPI FERTILIZER CO.,</b><br>Jackson, Miss.         | Guarantee.....                       |
| 18131              | H. G. Acid Phosphate 16%.....                                | W. F. Boone, Monticello .....        |
|                    |                                                              | Guarantee.....                       |
| *18130             | S. G. Blood & Bone .....                                     | W. F. Boone, Monticello .....        |
| *19119             | S. G. Blood & Bone .....                                     | W. F. Boone, Monticello .....        |
|                    |                                                              | Guarantee.....                       |
| 18132              | S. G. Improved Miss. Mixture ..                              | W. F. Boone, Monticello .....        |
|                    |                                                              | Guarantee.....                       |
|                    | <b>MT. PLEASANT FERTILIZER CO.,</b><br>Mt. Pleasant, Tenn.   |                                      |
| 18077              | S. G. North Miss. Cotton<br>Grower .....                     | J. C. Wallace & Son, Ripley .....    |
|                    |                                                              | Guarantee.....                       |
|                    | <b>NEW ORLEANS ACID &amp; FERT. CO.,</b><br>New Orleans, La. |                                      |
| 18044              | H. G. Bull Dog Acid Phos-<br>phate 16% .....                 | A. L. Hoyer, Lake .....              |
| 18125              | H. G. Bull Dog Acid Phos-<br>phate 16% .....                 | Osyka Supply Co., Osyka .....        |
|                    |                                                              | Guarantee.....                       |
| 18028              | S. G. Am. R. B. Superphos-<br>phate & Potash .....           | McLeod & Dantzler, Van Cleve .....   |
|                    |                                                              | Guarantee.....                       |
| 18022              | S. G. Goldsmith's Improved<br>Mixture .....                  | Clayton Ellis Co., Heidelberg .....  |
|                    |                                                              | Guarantee.....                       |
|                    | <b>NEWTON OIL &amp; M'F'G. CO.,</b><br>Newton, Miss.         |                                      |
| 18040              | H. G. Acid Phosphate 16%.....                                | R. I. O'Bannon, Forest .....         |
| 18081              | H. G. Acid Phosphate 16%.....                                | Farmers Union W'rh'se Co., Pontotoc  |
|                    |                                                              | Guarantee.....                       |
| 18073              | S. G. Banner C. & C. Brand .....                             | C. F. Palmer, Blue Mountain .....    |
| 18087              | S. G. Banner C. & C. Brand .....                             | T. C. Smith, Houston .....           |
|                    |                                                              | Guarantee.....                       |
|                    | <b>NITRATE AGENCIES COMPANY,</b><br>New Orleans, La.         |                                      |
| 18111              | H. G. Acid Phosphate 16%.....                                | Bramlitt Hardware Co., Corinth ..... |
|                    |                                                              | Guarantee.....                       |

\* Sample Nos. 18130 and 19119 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 18159              | 11.01              | 7.17                    | 4.53                      | 11.70               | 3.16                | 1.62               | 1.49             | 20.79                   |
| 18162              | 12.25              | 6.99                    | 3.63                      | 10.62               | 1.21                | 1.65               | 1.65             | 19.98                   |
| 18169              | 12.23              | 8.11                    | 3.85                      | 11.96               | 1.33                | 1.68               | 1.27             | 21.18                   |
|                    |                    | 8.00                    | 2.00                      | 10.00               | 1.00                | 1.65               | 1.50             | 19.31                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 18131              | 12.13              | 11.38                   | 5.52                      | 16.90               | .19                 |                    |                  | 16.35                   |
|                    |                    | 13.00                   | 3.00                      | 16.00               | 1.00                |                    |                  | 15.70                   |
| 18130              | 13.30              | 7.88                    | 4.45                      | 12.33               | 1.07                | 1.54               | 1.55             | 21.21                   |
| 19119              | 13.97              | 8.14                    | 4.07                      | 12.21               | 1.63                | 1.50               | 1.36             | 20.76                   |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.20             | 18.46                   |
| 18132              | 13.79              | 8.21                    | 3.07                      | 11.28               | .46                 | 1.79               | 2.05             | 21.76                   |
|                    |                    | 7.50                    | 2.00                      | 9.50                | 1.00                | 1.65               | 1.80             | 19.06                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 18077              | 9.38               | 6.58                    | 5.30                      | 11.88               | 4.38                | 1.55               | 1.02             | 20.15                   |
|                    |                    | 7.00                    | 3.00                      | 10.00               | 5.00                | 1.65               | 1.00             | 18.71                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 18044              | 13.68              | 12.68                   | 3.67                      | 16.35               | .17                 |                    |                  | 15.98                   |
| 18125              | 10.96              | 12.68                   | 4.04                      | 16.72               | .14                 |                    |                  | 16.32                   |
|                    |                    | 12.00                   | 4.00                      | 16.00               | 2.00                |                    |                  | 15.60                   |
| 18028              | 9.41               | 4.01                    | 4.83                      | 8.84                | .43                 | 1.71               | 2.59             | 19.10                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.21                   |
| 18022              | 12.77              | 6.94                    | 3.70                      | 10.64               | .03                 | 1.78               | 2.08             | 20.98                   |
|                    |                    | 7.00                    | 2.00                      | 9.00                | 2.00                | 1.65               | 1.50             | 18.21                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 18040              | 12.49              | 11.91                   | 4.55                      | 16.46               | .40                 |                    |                  | 16.01                   |
| 18081              | 12.23              | 12.27                   | 4.51                      | 16.78               | .45                 |                    |                  | 16.33                   |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 15.80                   |
| 18073              | 12.49              | 6.30                    | 2.22                      | 8.52                | 2.73                | 1.57               | 2.31             | 18.13                   |
| 18087              | 13.85              | 6.22                    | 2.90                      | 9.12                | .18                 | 1.56               | 2.79             | 19.16                   |
|                    |                    | 7.00                    | 1.50                      | 8.50                | 1.00                | 1.65               | 2.25             | 18.46                   |
|                    |                    |                         |                           |                     |                     |                    |                  |                         |
| 18111              | 16.29              | 12.77                   | 4.11                      | 16.88               | .20                 |                    |                  | 16.47                   |
|                    |                    | 14.00                   | 2.00                      | 16.00               | 1.00                |                    |                  | 15.80                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                        | Where and from Whom Collected.                 |
|--------------------|------------------------------------------------------------------------|------------------------------------------------|
| 18036              | H. G. Nitrate of Soda .....                                            | O. Hopkins, Hickory .....                      |
| 18152              | H. G. Nitrate of Soda .....                                            | Farmers Warehouse Co., Mize .....              |
|                    |                                                                        | Guarantee.....                                 |
|                    | <b>PIONEER FERTILIZER COMPANY,</b><br>Florence, Ala.                   |                                                |
| 18170              | O. G. Pioneer Cotton Grower ....                                       | J. P. Edwards, Mendenhall .....                |
|                    |                                                                        | Guarantee.....                                 |
|                    | <b>PLANTERS FERTILIZER &amp; CHEMICAL COMPANY,</b><br>New Orleans, La. |                                                |
| 18046              | H. G. Acid Phosphate 16%.....                                          | J. M. Spann & Co., Pelahatchie .....           |
| 18049              | H. G. Acid Phosphate 16%.....                                          | Simpson Merc. Co., Terry .....                 |
|                    |                                                                        | Guarantee.....                                 |
| 18026              | S. G. Planters Golden Mixture .....                                    | J. & S. Anderson, Van Cleve.....               |
| 18127              | S. G. Planters Golden Mixture .....                                    | Hyman Merc. Co., Summit .....                  |
| 18166              | S. G. Planters Golden Mixture .....                                    | Hyman Merc. Co., Summit .....                  |
|                    |                                                                        | Guarantee.....                                 |
| *18033             | S. G. Planters R. B. Superphosphate .....                              | J. R. Ainsworth, Bay Springs .....             |
| *19114             | S. G. Planters R. B. Superphosphate .....                              | J. R. Ainsworth, Bay Springs .....             |
|                    |                                                                        | Guarantee.....                                 |
|                    | <b>READ PHOSPHATE COMPANY,</b><br>Nashville, Tenn.                     |                                                |
| †18091             | S. G. Read's Blood & Bone No. 1 .....                                  | Wesson & Stovall, Saltillo .....               |
| †18508             | S. G. Read's Blood & Bone No. 1 .....                                  | Wesson & Stovall, Saltillo .....               |
| ‡18100             | S. G. Read's Blood & Bone No. 1 .....                                  | Phillips, Reinhart, Taylor Co., B'n'v'le ..... |
| ‡18510             | S. G. Read's Blood & Bone No. 1 .....                                  | Phillips, Reinhart, Taylor Co., B'n'v'le ..... |
|                    |                                                                        | Guarantee.....                                 |
| x18074             | S. G. Read's Nitro Phospho Potasso .....                               | T. J. Cole & Co., Ripley.....                  |
| x18505             | S. G. Read's Nitro Phospho Potasso .....                               | T. J. Cole & Co., Ripley.....                  |
| q18099             | S. G. Read's Nitro Phospho Potasso .....                               | Planters Merc. Co., Baldwin .....              |
| q18509             | S. G. Read's Nitro Phospho Potasso .....                               | Planters Merc. Co., Baldwin .....              |
|                    |                                                                        | Guarantee.....                                 |

\* Samples Nos. 18033 and 19114 were drawn from the same shipment.

† Samples Nos. 18091 and 18508 were drawn from the same shipment.

‡ Samples Nos. 18100 and 18510 were drawn from the same shipment.

x Samples Nos. 18074 and 18505 were drawn from the same shipment.

q Samples Nos. 18099 and 18509 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|-------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                   | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 18036              | .84               |                         |                           |                     |                     | 15.14              |                  | 64.35                   |
| 18152              | 4.08              |                         |                           |                     |                     | 14.86              |                  | 63.16                   |
|                    |                   |                         |                           |                     |                     | 15.25              |                  | 64.81                   |
| 18170              | 13.28             | 7.54                    | 3.92                      | 11.46               | .33                 | 1.19               | 1.33             | 18.60                   |
|                    |                   | 8.00                    | 2.13                      | 10.18               | 2.00                | .82                | 1.00             | 15.47                   |
| 18046              | 14.08             | 10.55                   | 5.58                      | 16.13               | .55                 |                    |                  | 15.57                   |
| 18049              | 13.14             | 11.25                   | 3.82                      | 15.07               | 1.01                |                    |                  | 14.69                   |
|                    |                   | 12.50                   | 3.50                      | 16.00               | 2.00                |                    |                  | 15.65                   |
| 18026              | 13.47             | 5.37                    | 4.79                      | 10.16               | .37                 | 1.58               | 1.80             | 19.21                   |
| 18127              | 14.35             | 6.62                    | 3.52                      | 10.14               | .55                 | 1.61               | 1.25             | 18.89                   |
| 18166              | 8.61              | 6.30                    | 4.71                      | 11.01               | .99                 | 1.62               | 1.35             | 19.88                   |
|                    |                   | 7.00                    | 2.50                      | 9.50                | 2.00                | 1.65               | 1.50             | 18.71                   |
| 18033              | 10.59             | 5.89                    | 4.65                      | 10.54               | .94                 | 1.69               | 1.09             | 19.40                   |
| 19114              | 14.10             | 4.35                    | 4.98                      | 9.33                | 1.22                | 1.77               | 1.20             | 18.49                   |
|                    |                   | 7.00                    | 2.50                      | 9.50                | 2.00                | 1.65               | 1.50             | 18.71                   |
| 18091              | 11.79             | 5.77                    | 4.72                      | 10.49               | .54                 | 1.36               | 1.41             | 18.26                   |
| 18508              | 11.47             | 5.43                    | 4.96                      | 10.39               | .74                 | 1.41               | 1.43             | 18.36                   |
| 18100              | 13.96             | 5.91                    | 4.50                      | 10.41               | .37                 | 1.40               | 1.60             | 18.55                   |
| 18510              | 13.82             | 5.60                    | 4.33                      | 9.93                | .74                 | 1.39               | 1.42             | 17.81                   |
|                    |                   | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 19.31                   |
| 18074              | 13.14             | 8.16                    | 2.64                      | 10.80               | 1.75                | 1.46               | 1.46             | 19.28                   |
| 18505              | 12.34             | 7.60                    | 2.39                      | 9.99                | 1.74                | 1.54               | 1.89             | 19.19                   |
| 18099              | 12.55             | 8.09                    | 2.39                      | 10.48               | .31                 | 1.48               | 1.75             | 19.33                   |
| 18509              | 11.77             | 7.86                    | 2.68                      | 10.54               | .46                 | 1.52               | 1.67             | 19.46                   |
|                    |                   | 8.00                    | 2.00                      | 10.00               | 2.00                | 1.65               | 1.50             | 19.31                   |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                              | Where and from Whom Collected.                            |
|--------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|
|                    | <b>REFUGE COTTON OIL COMPANY,</b><br>Columbus, Miss.                         |                                                           |
| 18085              | S. G. Sandy Land Special .....                                               | J. W. Hill & Co., Vardaman .....<br>Guarantee.....        |
|                    | <b>SOUTHERN OIL &amp; FERTILIZER CO.,</b><br>Meridian, Miss.                 |                                                           |
| 18141              | S. G. Cotton Grower .....                                                    | E. J. Harrison & Co., Magee .....<br>Guarantee.....       |
| 18047              | S. G. Superior Mixture .....                                                 | Brandon Merc. Co., Brandon .....<br>Guarantee.....        |
|                    | <b>STANDARD GUANO &amp; CHEMICAL<br/>M'F'G. COMPANY,</b><br>New Orleans, La. |                                                           |
| 18167              | S.G.Boll Weevil Knocker, No. 2                                               | Hyman Merc. Co., Summit .....<br>Guarantee.....           |
| 18122              | S. G. Miss. Home Guano.....                                                  | D. E. Lampton & Co., Tylertown .....                      |
| *18134             | S. G. Miss. Home Guano .....                                                 | The Lampton Co., Columbia .....                           |
| *19339             | S. G. Miss. Home Guano .....                                                 | The Lampton Co., Columbia .....<br>Guarantee.....         |
| †18121             | S. G. Stern's Am. R. B. Super-<br>phosphate .....                            | D. E. Lampton & Co., Tylertown .....                      |
| †19117             | S. G. Stern's Am. R. B. Super-<br>phosphate .....                            | D. E. Lampton & Co., Tylertown .....<br>Guarantee.....    |
| 18133              | H. G. Stern's Acid Phos-<br>phate 14% .....                                  | M. L. Brinson, Monticello .....<br>Guarantee.....         |
|                    | <b>TENNESSEE VALLEY FERTILIZER<br/>COMPANY,</b><br>Florence, Ala.            |                                                           |
| 18043              | Tiger H. G. Acid Phosphate<br>16%.....                                       | Loper Merc. Co., Lake .....<br>Guarantee.....             |
| 18088              | S. G. King Cotton Grower .....                                               | J. C. Marshall, Tupelo .....<br>Guarantee.....            |
|                    | <b>TUPELO FERTILIZER FACTORY,</b><br>Tupelo, Miss.                           |                                                           |
| 18103              | H. G. Cotton Belt Acid Phos-<br>phate 16% .....                              | Phillips, Reinhart, Taylor Co., B'v'lle<br>Guarantee..... |
| 17108              | S. G. Cotton Belt Blood &<br>Bone .....                                      | E. H. Pitts, Ecu .....                                    |

\* Samples Nos. 18134 and 19339 were drawn from the same shipment.

† Samples Nos. 18121 and 19117 were drawn from the same shipment.

Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent. | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|--------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                    |                  |                         |
| 18085              | 11.80              | 4.55<br>5.00            | 4.08<br>2.00              | 8.63<br>7.00        | .40<br>2.00         | 1.61<br>1.65       | 2.83<br>4.00     | 18.76<br>18.51          |
| 18141              | 12.05              | 8.01<br>7.00            | 3.16<br>3.00              | 11.17<br>10.00      | 1.47<br>1.00        | 1.55<br>1.65       | .90<br>1.00      | 19.46<br>18.71          |
| 18047              | 11.84              | 7.92<br>7.00            | 4.28<br>3.00              | 12.20<br>10.00      | .71<br>1.00         | 1.54<br>1.65       | .93<br>1.00      | 20.47<br>18.71          |
| 18167              | 12.85              | 7.81<br>7.00            | 1.60<br>3.00              | 9.41<br>10.00       | 1.23<br>1.00        | 2.13<br>2.00       |                  | 19.24<br>19.20          |
| 18122              | 23.70              | 7.05                    | 1.53                      | 8.58                | .08                 | 1.65               | 1.71             | 18.01                   |
| 18134              | 16.45              | 4.68                    | 2.26                      | 6.94                | .19                 | 1.57               | 1.84             | 15.92                   |
| 19339              | 12.89              | 4.60<br>7.00            | 2.65<br>2.50              | 7.25<br>9.50        | .21<br>1.00         | 1.93<br>1.65       | 1.71<br>1.50     | 17.62<br>18.71          |
| 18121              | 20.91              | 7.63                    | 1.99                      | 9.62                | .05                 | 1.27               | 1.51             | 17.29                   |
| 19117              | 17.31              | 8.62<br>7.00            | 1.82<br>2.50              | 10.44<br>9.50       | .10<br>1.00         | 1.10<br>1.65       | 1.58<br>1.50     | 17.56<br>18.71          |
| 18133              | 11.06              | 12.85<br>12.00          | 2.83<br>2.00              | 15.68<br>14.00      | .96<br>2.00         |                    |                  | 15.40<br>13.80          |
| 18043              | 12.16              | 13.16<br>12.00          | 4.21<br>4.00              | 17.37<br>16.00      | .26<br>2.00         |                    |                  | 16.95<br>15.60          |
| 18088              | 15.45              | 7.23<br>8.00            | 3.63<br>2.00              | 10.86<br>10.00      | .32<br>2.00         | 1.91<br>1.65       | 1.24<br>1.00     | 20.94<br>18.81          |
| 18103              | 17.38              | 10.72<br>13.00          | 5.51<br>3.00              | 16.23<br>16.00      | .29<br>2.00         |                    |                  | 15.68<br>15.70          |
| 17108              | 12.91              | 8.64                    | 3.49                      | 12.13               | .85                 | 1.70               | 1.68             | 21.90                   |

TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                   | Where and from Whom Collected.                 |
|--------------------|-------------------------------------------------------------------|------------------------------------------------|
| 18070              | S. G. Cotton Belt Blood & Bone .....                              | W. R. Bruce, Sherman.....                      |
| 18075              | S. G. Cotton Belt Blood & Bone .....                              | S. S. Finger Merc. Co., Ripley .....           |
| 18090              | S. G. Cotton Belt Blood & Bone .....                              | Wesson & Stovall, Saitillo .....               |
| 18094              | S. G. Cotton Belt Blood & Bone .....                              | J. R. Clayton, Guntown.....                    |
| 18095              | S. G. Cotton Belt Blood & Bone .....                              | Baldwyn Supply Co., Baldwyn.....               |
|                    |                                                                   | Guarantee.....                                 |
| *19337             | S. G. Cotton Belt Fertilizer .....                                | W. H. Dickerson, Blue Springs .....            |
| *18072             | S. G. Cotton Belt Fertilizer .....                                | W. H. Dickerson, Blue Springs .....            |
| 18076              | S. G. Cotton Belt Fertilizer .....                                | S. S. Finger Merc. Co., Ripley .....           |
| 18089              | S. G. Cotton Belt Fertilizer .....                                | Weaver & Aswell Co., Tupelo .....              |
| 18093              | S. G. Cotton Belt Fertilizer .....                                | J. R. Clayton, Guntown.....                    |
| 17107              | S. G. Cotton Belt Fertilizer .....                                | E. H. Pitts, Ecu .....                         |
|                    |                                                                   | Guarantee.....                                 |
| 18102              | S. G. Levi Phillips Mixture .....                                 | Phillips, Reinhart, Taylor Co., B'n'y'le ..... |
|                    |                                                                   | Guarantee.....                                 |
| 18110              | S. G. Tupelo Fertilizer .....                                     | Bramlitt Hardware Co., Corinth .....           |
|                    |                                                                   | Guarantee.....                                 |
| 17106              | H. G. Cotton Belt Fertilizer .....                                | E. H. Pitts, Ecu .....                         |
|                    |                                                                   | Guarantee.....                                 |
| 18071              | S. G. Tupelo German Kainit .....                                  | W. H. Dickerson, Blue Springs .....            |
| 18092              | S. G. Tupelo German Kainit .....                                  | J. R. Clayton, Guntown.....                    |
| 17109              | S. G. Tupelo German Kainit .....                                  | E. H. Pitts, Ecu .....                         |
|                    |                                                                   | Guarantee.....                                 |
|                    | <b>VIRGINIA-CAROLINA CHEMICAL<br/>COMPANY,<br/>Memphis, Tenn.</b> |                                                |
| 18039              | H. C. V. C. Superphosphate .....                                  | A. C. Hailey, Hickory .....                    |
| 18065              | H. C. V. C. Superphosphate .....                                  | Wagner & Co., Water Valley .....               |
|                    |                                                                   | Guarantee.....                                 |
| 18096              | S. G. Buck's Best .....                                           | Bethany Merc. Co., Bethany.....                |
|                    |                                                                   | Guarantee.....                                 |
| 18031              | S. G. Mobile Double Eagle<br>Guano .....                          | Lucedale Com. Co., Lucedale .....              |
| †18079             | S. G. Mobile Double Eagle<br>Guano .....                          | Furr & Perkins, Toccapola .....                |
| †18506             | S. G. Mobile Double Eagle<br>Guano .....                          | Furr & Perkins, Toccapola .....                |
| 18105              | S. G. Mobile Double Eagle<br>Guano .....                          | Booneville, Merc. Co., Booneville .....        |
| 18117              | S. G. Mobile Double Eagle<br>Guano .....                          | Robinson Merc. Co., Centreville .....          |
| 18123              | S. G. Mobile Double Eagle<br>Guano .....                          | D. E. Lampton & Co., Tylertown .....           |
|                    |                                                                   | Guarantee.....                                 |

\* Samples Nos. 19337 and 18072 were drawn from the same shipment.

† Samples Nos. 18079 and 18506 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                     |                     | Nitrogen—Per Cent | Potash—Per Cent. | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|---------------------|---------------------|-------------------|------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent. | Insoluble Per Cent. |                   |                  |                         |
| 18070              | 13.09              | 7.84                    | 4.28                      | 12.12               | .27                 | 1.75              | 1.77             | 22.11                   |
| 18075              | 14.08              | 5.96                    | 6.17                      | 12.13               | .36                 | 1.52              | 1.37             | 20.56                   |
| 18090              | 14.91              | 6.88                    | 4.07                      | 10.95               | .37                 | 1.76              | 1.57             | 20.69                   |
| 18094              | 13.34              | 7.33                    | 4.50                      | 11.83               | .34                 | 1.79              | 1.95             | 22.12                   |
| 18095              | 13.27              | 7.11                    | 4.20                      | 11.31               | .33                 | 1.56              | 1.50             | 20.15                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>       | <i>1.50</i>      | <i>19.21</i>            |
| 19337              | 15.37              | 5.19                    | 3.63                      | 8.82                | .18                 | 1.59              | 1.47             | 17.57                   |
| 18072              | 16.33              | 5.17                    | 3.32                      | 8.49                | .33                 | 1.72              | 1.60             | 17.92                   |
| 18076              | 16.71              | 5.87                    | 3.17                      | 9.04                | .46                 | 1.61              | 1.61             | 18.08                   |
| 18089              | 18.37              | 8.37                    | 3.05                      | 11.42               | .22                 | 1.76              | 1.52             | 21.26                   |
| 18093              | 16.70              | 7.59                    | 3.08                      | 10.67               | .14                 | 1.65              | 1.67             | 20.11                   |
| 17107              | 15.98              | 8.92                    | 2.70                      | 11.62               | .79                 | 1.67              | 1.52             | 21.13                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>       | <i>1.50</i>      | <i>19.21</i>            |
| 18102              | 15.77              | 6.94                    | 2.95                      | 9.89                | .22                 | 1.68              | 1.53             | 19.25                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>       | <i>1.50</i>      | <i>19.21</i>            |
| 18110              | 14.57              | 8.06                    | 3.64                      | 11.70               | .22                 | 1.68              | 1.44             | 21.09                   |
| 17106              | 15.14              | 8.28                    | 2.57                      | 10.85               | .56                 | 1.68              | 2.14             | 20.96                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>1.00</i>         | <i>1.65</i>       | <i>2.00</i>      | <i>19.71</i>            |
| 18071              | 1.54               |                         |                           |                     |                     |                   | 14.38            | 14.38                   |
| 18092              | 1.28               |                         |                           |                     |                     |                   | 14.96            | 14.96                   |
| 17109              | .90                |                         |                           |                     |                     |                   | 14.00            | 14.00                   |
|                    |                    |                         |                           |                     |                     |                   | <i>12.00</i>     | <i>12.00</i>            |
| 18039              | 10.51              | 12.63                   | 5.34                      | 17.97               | .48                 |                   |                  | 17.44                   |
| 18065              | 15.47              | 11.28                   | 5.25                      | 16.53               | .71                 |                   |                  | 16.01                   |
|                    |                    | <i>11.50</i>            | <i>4.50</i>               | <i>16.00</i>        | <i>2.00</i>         |                   |                  | <i>15.55</i>            |
| 18096              | 12.88              | 7.32                    | 3.10                      | 10.42               | .51                 | 1.86              | 1.84             | 20.90                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>2.00</i>         | <i>1.65</i>       | <i>1.50</i>      | <i>19.21</i>            |
| 18031              | 10.66              | 8.14                    | 2.70                      | 10.84               | .55                 | 1.58              | 2.74             | 21.11                   |
| 18079              | 13.36              | 7.56                    | 3.52                      | 11.08               | .51                 | 1.45              | 1.71             | 19.71                   |
| 18506              | 13.24              | 7.72                    | 3.36                      | 11.08               | .55                 | 1.35              | 1.87             | 19.46                   |
| 18105              | 8.80               | 6.38                    | 3.11                      | 9.49                | 2.02                | 1.62              | 1.84             | 18.85                   |
| 18117              | 11.24              | 7.97                    | 2.87                      | 10.84               | .61                 | 1.94              | 1.35             | 21.23                   |
| 18123              | 14.88              | 7.79                    | 2.88                      | 10.67               | .51                 | 1.82              | 1.51             | 20.69                   |
|                    |                    | <i>7.00</i>             | <i>3.00</i>               | <i>10.00</i>        | <i>2.00</i>         | <i>1.65</i>       | <i>1.50</i>      | <i>19.21</i>            |



TABLE V.—Analyses of Commercial Fertilizer

| Laboratory Number. | Name of Brand and Manufacturer.                                      | Where and from Whom Collected.                          |
|--------------------|----------------------------------------------------------------------|---------------------------------------------------------|
| 18080              | S. G. Mobile R. B. Am. Super-phosphate .....                         | Furr & Perkins, Toccapola .....                         |
| 18116              | S. G. Mobile R. B. Am. Super-phosphate .....                         | Robinson Merc. Co., Centreville .....<br>Guarantee..... |
| 18050              | S. G. Royal Blood, Bone & Potash.....                                | Wm. Atkinson & McDonald Co. Wes.                        |
| *18109             | S. G. Royal Blood, Bone & Potash.....                                | Bramlitt Hardware Co., Corinth .....                    |
| *19116             | S. G. Royal Blood, Bone & Potash.....                                | Bramlitt Hardware Co., Corinth .....<br>Guarantee.....  |
| 18025              | S. G. Scott's Gossypium Phospho .....                                | Perkins & Co., Brooklyn .....                           |
| †18035             | S. G. Scott's Gossypium Phospho .....                                | O. Hopkins, Hickory .....                               |
| †18503             | S. G. Scott's Gossypium Phospho .....                                | O. Hopkins, Hickory .....                               |
| 18066              | S. G. Scott's Gossypium Phospho .....                                | Newberger Merc. Co., Coffeeville .....                  |
| 18069              | S. G. Scott's Gossypium Phospho .....                                | Greer & Greer, Potts Camp .....                         |
| 18078              | S. G. Scott's Gossypium Phospho .....                                | A. B. Sneed & Sons, Pontotoc .....                      |
| 18104              | S. G. Scott's Gossypium Phospho .....                                | T. D. Rees & Co., Booneville .....                      |
| 18165              | S. G. Scott's Gossypium Phospho .....                                | Holmes Bros., McComb .....<br>Guarantee.....            |
| 18068              | S. G. Scott's State Standard Guano .....                             | Greer & Greer, Potts Camp .....<br>Guarantee.....       |
| †18142             | H. G. Victor Guano .....                                             | H. P. Gates Merc. Co., Magee .....                      |
| †19120             | H. G. Victor Guano .....                                             | H. P. Gates Merc. Co., Magee .....<br>Guarantee.....    |
|                    | <b>WESSON COTTON OIL &amp; FERTILIZER COMPANY,<br/>Wesson, Miss.</b> |                                                         |
| 18051              | H. G. Acid Phosphate 16%                                             | Wesson Cotton Oil & Fert Co., Wesson<br>Guarantee.....  |
| 18052              | S. G. Mutual Friend Mixture ...                                      | Wesson Cotton Oil & Fert. Co., Wesson<br>Guarantee..... |

\* Samples Nos. 18109 and 19116 were drawn from the same shipment.

† Samples Nos. 18035 and 18503 were drawn from the same shipment.

‡ Samples Nos. 18142 and 19120 were drawn from the same shipment.

## Collected by State Chemist, Season 1910-1911.

| Laboratory Number. | Moisture—Per Cent. | Phosphoric Acid.        |                           |                       |                     | Nitrogen—Per Cent.  | Potash—Per Cent.    | Relative Value Per Ton. |
|--------------------|--------------------|-------------------------|---------------------------|-----------------------|---------------------|---------------------|---------------------|-------------------------|
|                    |                    | Water Soluble Per Cent. | Citrate Soluble Per Cent. | Available Per Cent.   | Insoluble Per Cent. |                     |                     |                         |
| 18080              | 13.17              | 7.83                    | 3.52                      | 11.35                 | .66                 | 1.71                | 1.46                | 20.86                   |
| 18116              | 6.91               | 5.82<br><i>7.00</i>     | 3.89<br><i>3.00</i>       | 9.71<br><i>10.00</i>  | 1.25<br><i>2.00</i> | 1.77<br><i>1.65</i> | 1.77<br><i>1.50</i> | 19.58<br><i>19.21</i>   |
| 18050              | 9.58               | 6.12                    | 3.77                      | 9.89                  | 1.72                | 1.93                | 1.58                | 20.28                   |
| 18109              | 12.53              | 7.32                    | 3.30                      | 10.62                 | .55                 | 1.32                | 1.51                | 18.47                   |
| 19116              | 16.15              | 7.50<br><i>7.00</i>     | 2.96<br><i>3.00</i>       | 10.46<br><i>10.00</i> | .56<br><i>2.00</i>  | 1.37<br><i>1.65</i> | 1.79<br><i>1.50</i> | 18.82<br><i>19.21</i>   |
| 18025              | 10.76              | 8.11                    | 3.27                      | 11.38                 | .32                 | 1.95                | 2.36                | 22.84                   |
| 18035              | 11.60              | 8.39                    | 2.68                      | 11.07                 | .78                 | 1.62                | 1.60                | 20.39                   |
| 18503              | 12.70              | 7.56                    | 2.80                      | 10.36                 | .74                 | 1.93                | 1.70                | 21.02                   |
| 18066              | 12.31              | 7.77                    | 3.16                      | 10.93                 | .73                 | 1.88                | 1.53                | 21.23                   |
| 18069              | 13.15              | 8.19                    | 2.48                      | 10.67                 | .78                 | 1.50                | 1.85                | 19.71                   |
| 18078              | 12.05              | 6.49                    | 3.84                      | 10.33                 | .63                 | 2.02                | 1.83                | 21.39                   |
| 18104              | 9.53               | 6.49                    | 3.54                      | 10.03                 | 2.16                | 1.60                | 1.67                | 19.15                   |
| 18165              | 15.46              | 7.04<br><i>7.00</i>     | 2.54<br><i>3.00</i>       | 9.58<br><i>10.00</i>  | .22<br><i>2.00</i>  | 1.83<br><i>1.65</i> | 1.55<br><i>1.50</i> | 19.61<br><i>19.21</i>   |
| 18068              | 13.26              | 6.47<br><i>6.00</i>     | 2.59<br><i>2.50</i>       | 9.06<br><i>8.50</i>   | .43<br><i>2.00</i>  | 1.81<br><i>1.65</i> | 2.38<br><i>2.00</i> | 19.78<br><i>18.11</i>   |
| 18142              | 13.51              | 6.98                    | 4.74                      | 11.72                 | 1.28                | 2.70                | 1.51                | 25.40                   |
| 19120              | 14.31              | 8.37<br><i>7.00</i>     | 4.93<br><i>3.00</i>       | 13.30<br><i>10.00</i> | 1.15<br><i>2.00</i> | 2.25<br><i>3.30</i> | 1.00<br><i>1.50</i> | 24.70<br><i>26.23</i>   |
| 18051              | 13.70              | 12.83<br><i>14.00</i>   | 3.81<br><i>2.00</i>       | 16.64<br><i>16.00</i> | .51<br><i>1.00</i>  |                     |                     | 16.26<br><i>15.80</i>   |
| 18052              | 12.32              | 7.73<br><i>7.00</i>     | 3.10<br><i>2.00</i>       | 10.83<br><i>9.00</i>  | .74<br><i>1.00</i>  | 1.65<br><i>1.65</i> | 1.94<br><i>1.75</i> | 20.56<br><i>18.46</i>   |







